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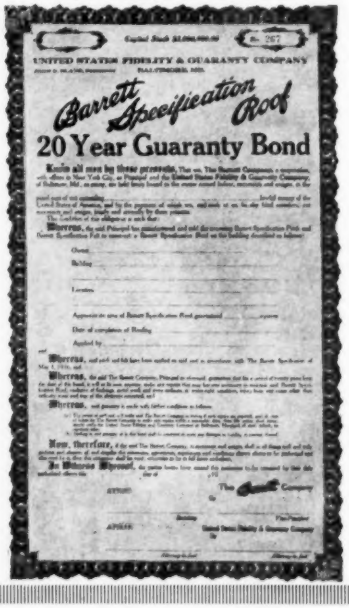

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A Picturesque Byway in Washington — Ben J. Lubschez

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Shadows and Straws

SOME PROGRESS IS BEING MADE in the housing of workmen engaged in the building of our merchant marine. The projects at Hog Island, Sparrow's Point, Newport News, and Camden are being got under way as fast as possible, while the unfinished work at Bristol is being taken over by the Shipping Board and will be completed under its direction. The appropriation for the Department of Labor still languishes in the hands of the Committee on Public Buildings and Grounds, but the work of organizing the new bureau in the Department of Labor is proceeding. Members of the Institute and the friends of the profession generally will welcome the appointment by Mr. Eidlitz, the Director of Housing, of Burt L. Fenner, Secretary of the Institute for two years, and a member of the firm of McKim, Mead & White, as director of the architectural division of the housing bureau.

The architects already selected for the housing work above mentioned are Owen Brainard (Hog Island), Electus D. Litchfield (Camden), Francis Y. Joannes (Newport News), E. L. Palmer, Jr., (Sparrow's Point), while the work at Bristol is in the hands of Messrs. Mann & MacNeille. It seems quite safe to say that no more important architectural commissions have ever been given out in this country, if one considers both the nature of the result that is demanded by the war emergency and the immeasurable effect which the work of these men, and those whose guidance and advice form no less a part of the contribution, will have upon the future of the country.

THE GRAVITY OF THIS QUESTION has been too little appreciated. The mild and negative efforts of the past toward correcting housing evils have not been sufficient either to produce any result or to arouse more than a passing and generally charitable interest. Now the question comes to the front with all the alarming symptoms of a dangerous peril. And if the conference on housing at Philadelphia late in February had anything of value to offer, it was the testimony of those manufacturers who had struggled with the problem for months and who urged that all considerations of expediency and cost give way to their demonstrated necessity for permanent houses. It was an appeal to which Congress and the Administration ought to have listened. It was an appeal which others made in vain all through months of discouragement. Fortunately, a start has been made. It is wofully late, but that must be forgotten in trying to make up for some of the lost time.

EDUCATION IS A WORD which has come to mean so much and so little that one almost hesitates to use it, yet we have no other to take its place. The article by Mr. Tudor, in this issue, is the first of a series which will attempt to get at the bottom of what we call the education of the architect. It is not an easy problem to face, and the process he tries to analyze has its beginnings long before the student enters the architectural school. But this is quite as true of any other kind of professional education. All that Mr. Tudor says in relating the work of the architect to the large physical problem of our communities might be said with equal emphasis of any other profession, for each has its relation to this larger whole. He is not decrying one profession as more lacking than

another, nor would he, we believe, be unable to apply his logic to any other interest in life, whether commercial, industrial, or scientific.

THE PROBLEM IS FIRST to find out what we are trying to do when we give our children and youth over to the educational systems of our country. What is the plan under which we are working? What is the relation of that plan to the working out of democracy? The answer is that nobody knows—that we have no plan—that there is no relation between education and that larger whole, but that the emphasis all goes into the relationship of the individual to his individual work. Oh, there are exceptions, but they are either those who manage to escape all the sterilizing influences of the educational system and to find their own relation to the whole in spite of the system, or those who have the good fortune to come under the influence of personalities which eclipse and obscure the system in which they refuse to become enmeshed. That such teachers will always be the hope of any system cannot be denied, but they are far too few, because they are not the product of any plan which seeks to increase their number. Now is the moment to look into this subject of education with a powerful lens. There probably has never been a time when it was more agitated or when there was more dissatisfaction with the result. The last few years have witnessed an almost continuous discussion along many lines, and the value of everything in the school has been questioned. But the discussion becomes futile and unilluminating until we can decide just what it is that we wish to accomplish by education. Given a goal, the means of reaching it may at least be studied intelligently. Without a goal, why waste our time in discussing the means of attaining it?

Mr. Tudor recognizes that the goal toward the attainment of which he believes the education of the architect should be directed is not a static thing, but that it is a constantly changing and sometimes almost elusive state of progress. Yet there is a fundamental basis upon which this progress should and does rest, and the task before educators as well as governments is to translate that powerful impulse which prompts men in war to sacrifice their lives for the principle of democracy into an impulse that will lead men to live their lives, in peace, in order that the principle of democracy may become a vital force. In the stage of development to which it had attained in July, 1914, it was unable to arrest the otherwise inevitable cataclysm. The problem of making democracy the universal instrument dedicated to the wise and constantly progressive service of mankind is a problem of education—a problem of pointing out the goal—a problem of freeing the minds of children instead of binding them hopelessly by the restrictive and repressive measures which have now been fastened, like leeches, upon our educational systems.

In the task of changing these things, the architect cannot stand aloof without risking a complete relegation to oblivion. It is in the field of education that he must seek the answer to his queries as to why the world seems unduly to pass him by.

THE CREATION OF A CONSTRUCTION DIVISION in the War Department, as already announced by Acting Secretary Crowell, indicates that the great building projects, amounting to over a billion dollars and destined to accelerate the prosecution of the war, are finally to be coördinated. The new division will replace the cantonment organization and will deal comprehensively with the whole War Department building program. At the head of it has been placed Professor A. N. Talbot, of the University of Illinois, president of the American Society of Civil Engineers, and the board includes John Lawrence Mauran, of St. Louis, president of the American Institute of Architects; Charles T. Main, of Boston, president of the American Society of Mechanical Engineers; John R. Alpine, representing the American Federation of Labor; R. Goodwyn Rhett, of Charleston, S. C., president of the Chamber of Commerce of the United States; E. W. Rice, of Schenectady, N. Y., president of the American Institute of Electrical Engineers; Frederick L. Cranford, of Brooklyn, president of the General Contractors' Association of New York, and Oscar A. Reum, of Chicago, representing the Building Construction Employers' Association.

There are already under way in the United States eight-five big jobs, aggregating $205,000,000. There are in prospect now 120 more, representing $278,000,000. In addition, there are forty jobs for housing troops, representing

$390,000,000, while hospital construction alone represents $10,000,000.

It is reported that all work will be done henceforth under the "cost plus sliding scale of fixed fee," in which fixed fees to contractors range from 7 per cent on contracts on $100,000 or less down to as low as 1¾ per cent on the very largest amounts. The fee, according to this form, is fixed when the contract is let, and if the cost exceeds the estimate because of higher labor and material prices, the contractor receives no additional compensation whatever. Labor and material prices always will be subject to approval by the Government.

The Double Staircase

SOME years ago—I might have said many, since the last three have pushed all the preceding ones so far back into the past—we sat at dinner in the Café des Venitiens at Liége, my friend Jean Venelle and I. It was a gala night in the old Walloon city that then lay smiling beside the Meuse on an evening in early spring. Smiling—indeed I always think of Liége as smiling, until that fateful day in August, when the invading hosts fell on it with their engines of destruction and Belgium entered the valley of the shadow of death. Poor smiling Liége! Sad flowing Meuse! And who is sitting at dinner in the Venitiens on these nights of this new spring? What shadows fill the little square before the Theatre?

On that night, the square was brightly lighted. Jean had promised me a treat, and although I had seen Coquelin at Paris, and was now to see him for the first time in "Cyrano," I knew that the nature of the treat was something more than either Coquelin or Rostand.

"It will be quite different from anything you have ever seen," said Jean, with an inscrutable twinkle in his eyes, and so it was. But I was content to wait. I did not even suspect his meaning when we entered the theatre, although the bare walls seemed almost brutally plain and joyless. It was even so cool that we sat without taking off our overcoats and watched the last-comers pick their way to their places. Then there came the three loud taps and the curtain rose on the barest stage I had ever seen.

Today, I remember but one detail. All recollection of the other crude and meagre bits of property has completely vanished. Literally, there was no scenery, but never shall I forget Roxane, standing on a box some two feet high, listening to Cyrano as he told her that eloquent tale. No balcony clinging to an ivied wall was ever so beautiful as this. Wall there was none, and yet I saw it rising in the moonlight, tenderly gray in texture, exquisitely graceful in its pointing. Jasmine there was none, and yet I saw it creeping upward toward the balcony and felt the breath of its perfume floating on the still air of night. All the beauty of all the arts was there—brought into being by the music which fell from the voice of a man—and the soft answers of a woman.

As we walked home on the boulevard that night, I suddenly remembered the prophecy of Jean, and I was grateful for the kindly wisdom which had left me the chance of making my own discovery. A few words would have spoiled it all, but Jean was always wise in those things. Glad am I that death took him before Liége was plunged in tears.

Since that night I have seen many plays and many stage settings, but it was not until I saw the "Yellow Jacket," and fell a victim to the spell of the love-boat—which M. Roché described so vividly in these pages last year—that I had such an experience as on that night in Liége, and up to the time when I paid my first visit to the Theatre du Vieux Colombier, in New York, the skill and craft of the stage manager had not been able to efface those two images from my mind. Imagery in stage setting was clearly triumphant over realism. But the double staircase in "Les Frères Karamazov" will remain as the most haunting of all my memories of the theatre. From the great room in the now immortal house, it ascends to the right, and from the railed landing which marks the *deuxiéme étage*, it mounts to the left. The balustrade is simple in the extreme, and even seems too light and frail to serve its purpose. During the play only three men are seen on those stairs, and no woman's

foot even so much as ventures toward them. Perhaps that helps to define and sharpen the gloomy prescience that hangs over it. The drunken father mounts it totteringly, descends to sup, remounts it for a change of garment, and descends it for the last time. Smerdiakov climbs it to do his valet's service, descends to serve his master with the evening meal, mounts it again, noisily, until chided by the now besotten *amoureux*, to bring down the three thousand roubles that are to be hidden for Grouchenka, behind the icon. Dmitri and Aliocha never set foot upon it.

Ivan climbs it elegantly, with the conscious air of his superior ways; climbs it angrily, climbs it murderously with Smerdiakov huddled on the lower treads, and descends it to leave for Moscow. But, until the last act, he goes no further than the first landing, to the right of which we are left to imagine a chamber in keeping with the proud, unhappy occupant.

Then, in the final act, Smerdiakov mounts it slowly and wearily, never to descend again, for Ivan, seeking him in the last fleeting moment of his fast vanishing sanity, returns with a look of horror and the fatal word on his ashen lips.

As a piece of domestic architecture, that staircase might invite criticism. Who cares? It stands like some simple but moveless symbol— a clepsydra or an hour-glass—marking the inflexible passage of time. It offers the haunting suggestion that "Three Men and a Staircase" might almost be the title of the play, for that is the memory which crystallizes and detaches itself after the curtain has fallen and you have escaped to the quiet of your room. The going and coming of those men upon that stair seems symbolic of the doom which each weaves for himself and for the other. It is a tale of primitive passions, of great exaltations and dark depressions, of childish questionings and cunning baseness. Through it all there flows the torrential out-pouring of Dostoievsky; it is brimming over with the soul of that nation which we are so pathetically far from understanding in its present hour of agony. That double staircase with its slender balustrade, seems the mystic vehicle by which men ride and fall, as time, now plodding slowly, now swooping like a flash from the sky, finally lays a hand upon their shoulder.

Verily, the double staircase in the "Frères Karamazov" is an achievement in stage setting of which M. Copeau may well be proud. As for the consummate skill with which the work of Dostoievsky was dramatized while still preserving all the quality of one of the greatest of books by one of the greatest of writers, no praise could be too high.—C. H. W.

French Architectural Students in the War

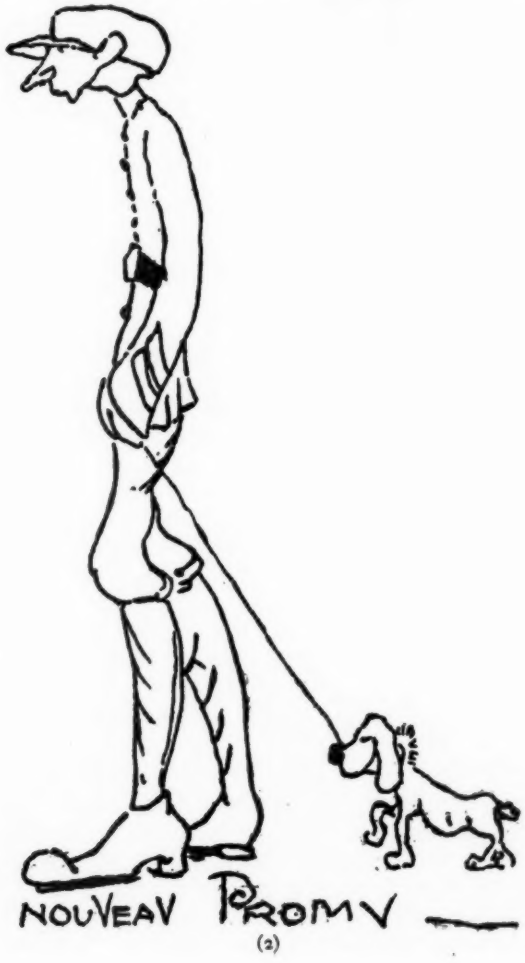
EVERY American who has ever been at the Ecole will remember the prevailing good humor of his French comrades—even under the most trying circumstances. In the midst of a "charrette," even when a bottle of ink was spilled over a finished drawing, there were only battles of words, of highly colored profanity, but never a resort to blows. So during the last three trying years it would seem as if the Frenchman's sense of humor has been a wonderful asset under the soul-wearying grind of war.

Nothing exemplifies this better than a reading of the "Gazettes" published at the Ecole des Beaux Arts. Early in the fall of 1914 a committee of American architectural students, to their everlasting credit be it said, undertook the task of making itself the medium of an interchange of news and correspondence between their French comrades at various points on the front or in other parts of the military service. Through an admirable scheme they have also helped to support the families of architects who have been mobilized—a scheme which deserves to be described in a separate article. The correspondence exchange soon developed into a series of mimeographed "Gazettes," one published for each atelier, the "Gazette Laloux," "LePascal," etc. These are typewritten (mimeographed) pamphlets of twenty or thirty pages, which are sent out by mail to the students and former students wherever they may happen to be. Enclosed with the "Gazette" is an addressed sheet of letter-paper in the form of a reply postal

on which the men in the trenches may scribble their news items for publication the following month. The enormous task of reproduction and editorial work on the "Gazette" has been in a great measure managed by the American students, and the cost of publication, as well as the funds for the relief work, have been provided by the monthly subscriptions of former students of the Ecole in America.

The arrangement of these "Gazettes" is fairly uniform; an illustrated title-page (see Fig. 1 as an example); a page containing some message of encouragement from the professor of that particular atelier; an inside title-page with the emblem of the "Gazette" and some announcement like that of the "Redon," that it is "L'organe le plus formidablement poilu

(1)



(2)

de tous les organes les plus poilu," a page in a decorated border with the fatal list of names inscribed, "Mort au Champ d'Honneur," then a list of those who have "disappeared," those who are prisoners of war, and a list of honors, military medals, "citations," etc. Then follows news from comrades, young and old, alphabetically arranged and interspersed with roughly drawn (mimeographed) illustrations, caricatures, etc.; the grave and gay inextricably mixed up.

The correspondence generally gives all sorts of details of life at the front, in France, in Saloniki, in Mesopotamia; naturally nothing is included that could give military information of importance. One man talks about what he does in his spare time to get rid of his "cafard" (grouch); another tells of a chance encounter with a former comrade; yet another speaks of the long-awaited leave of absence; all of them send messages of good cheer, speak of the happy days that are gone, and long for the peaceful days to come. Not one ever suggests quitting

until the fight is well won. Not that they like what they are doing—they detest it. They grit their teeth and mean to see it through, despite mud and cold, wounds or death.

What saves all this exchange of experience from the grimmest kind of drama is the ever-present sense of humor. Here is a man who sketches a newly promoted officer (2); another who recites a pleasant incident of camp-life in which the chef finds fault with the man using a cooking utensil for bathing purposes (3); a third who suggests a brilliant scheme for a "cantiniere" for a regiment of aviators (4). Perhaps the best in recent numbers is the illustrated reply of a man who had heard that the Ministry of Fine Arts proposed to hold an architectural competition in design for students in the service so that even those in the trenches might not get out of practice in drawing (5). Elsewhere, a man who describes his seemingly endless life in the mud of the trenches as being a sequence of mud and then more mud and rain and then just plain mud, says "la seule chose

(3)

(4)

que je craint, c'est qua la fin de la guerre je n'aimerai plus la boue." How can a nation be doomed that can find a source of humor in its worst agonies?

Recently, the "Gazettes" are full of comments on the American soldiers, their frankness, their naive manners, their constant gum-chewing, and their sense of certainty that if only once they can "get at" the Kaiser it will be all up with him. In July they were all for celebrating the Fourth of July. Here one Frenchman writes "let us all sing together now as we did in the old school-days a 'John Broun's Body'!" Another remembering from the Ecole some ex-Yale man's "Brek-kek-kek-kex koax koax" of the frog chorus, hopes that every Frenchman will now join in the great American cheer "haricot-verts-co-vert-co-vert" or the American national anthem starting "rosbif aux pommes, good-bye!"

The papers are full of messages to American comrades in all parts of the world. Recently in the "Redon" an architect in Toulon who said his son was in the army at Saloniki sent messages in the same note to former comrades, one now in Algeria, one with the Servian army, one on the Northern front, one lying wounded in a hospital,

(5)

(6)

and the writer in New York. A study of twenty or thirty of these "Gazettes" shows never a word of bitterness. Everlasting courage and steadfastness are characteristics of every page of these remarkable publications. At most there is an occasional expression of wonder as to whether or not, at the close of the war, they who still live will be able to resume their professional practice, or if it will all be gone or taken away from them. This particularly interests them as to the possible reconstruction work of the invaded regions and destroyed monuments (lest we forget, and try to get professional jobs at their expense!)

We architects of America can indeed be proud of the spirit of our French confrères as exemplified in these highly interesting atelier "Gazettes."

ROBERT D. KOHN.

The Circean Shadow!

By RICHARD WALLACE TUDOR

"I have a little shadow that goes in and out with me,
And what can be the use of him is more than I can see."
—ROBERT LOUIS STEVENSON.

WHAT is the matter with the architectural profession?

The spasmodic questioning of the last few years has been revived under the stress of war, with a newer and more insistent emphasis, expressive of a healthy discontent. With that effort which has been made to stimulate and capitalize this discontent, I am not concerned. It is to the questionings of the thoughtful element in the profession to which one may well address one's attention, for, although even these do appear, now and then, to suffer a little from hasty conclusions and generalizations, they reveal evidence of a sincere desire to be more than plaintive or destructive.

A common source of this unrest is found in the oft-repeated assertion that the architectural profession has not been fully—or adequately—utilized by the Government in the nation's hour of need. The facts of the case should be carefully examined, for there seems reason to believe that such a failure was, at least, no greater in degree than the Government's failures in many directions—since a war-machine cannot be organized over night—and certainly no greater in this particular respect than was the case in either France or England, where the architectural profession enjoyed the advantage of a generally wider recognition. It may well prove, as all the facts come to be known, that the Government of the United States was quicker in its recognition of the value of the architect than was the case in either of the other countries.

But, in sum and substance, all of these questions generally bring forth the complaint that the architect is not appreciated or understood. As a remedy for this condition, there is frequently proposed some form of advertising or propaganda which shall set forth the virtues of the architect and his profession. Why is it assumed that the public can be made to understand and appreciate the architect by such a method?

The issue has been raised. Let us discuss it.

It is clearly evident from these voluminous outpourings that the writers assume that the architect is not understood, that he is not appreciated. But this is an assumption. The question at bottom is this: Is the architect misunderstood? Here, surely, we have a question which must be answered before we may proceed. Shall we demand a categorical answer from a score of architects, a score of business men, and scores from other groups, so that we may tabulate the result and find the answer? Shall be obtain opinions from various people in other callings and check them to our own? Or, shall we ourselves endeavor seriously to discover what is our real composite character—the character of the entire profession, not a limited group—in order then to determine whether or not the public judges us correctly?

For we must reckon with the possibility (perish the thought!) that the public's appraisal of our qualities is a fair appraisal, and that what we characterize as a lack of appreciation is nothing more or less than an almost uncanny ability to value us properly.

But how can we get at the truth? It is of tremendous importance to get this matter straight. We may point to our individual efforts and say of this building or that: "Isn't that beautiful, or fine, or monumental, or adequately expressive of the actuating forces?" And the public may agree. So we win our case. But, on the other hand, the public, in a moment of sanity and rational purpose, may point to our ugly, ungainly, uneconomical, hodge-podge cities (in which a goodly number of its structures have been designed by members of the profession) and then what have we to say? What *do* we say? "*They* did it." In other words, we take unto ourselves the responsibility for the nice little things we do, and we "pass the buck" of responsibility to the public ("they") for the things we fail to do. And the public becomes confused and all mixed up about architecture

and art, and we become greatly confused as well, and write letters to the architectural press and act a little peevish.

But we are not getting at the answer. How do we come by this attitude? What are the influences which ultimately form our judgments and direct our activities? Let us take a little excursion into that smug, pre-planned region of our life which we call "the formal education of the architect."

The Significance of the First Step

The agencies professing to teach architecture and allied subjects turn out an ever-increasing number of young persons presumably ready to take their place in the ranks of the vocationally qualified. Are these young persons ready? Are they equipped? This is a vitally important question, for the use, and the good, and the purpose of architecture are tested by our entire physical environment. We may test it by our own professional standards, but the public only laughs at us, applies its own test, and keeps on looking for real leadership.

But before we answer the question as to the quality of equipment furnished to students by our architectural schools, there is a still more important matter first to be determined. What is our standard of appraisal? For what should they be ready? For what equipped? Have we considered this phase of the problem seriously? Have we thought of it in terms of social values, of democratic institutions, of democracy?

What are we driving at? What is our purpose? What is our plan?

Have we a plan?

Apparently we have; for have we not schools and ateliers, examinations, degrees, prizes, scholarships, and trips abroad? Do these not reflect purpose, and direction, and suggest that there surely is a plan? Seemingly they do.

But let us examine this conscious effort in the light of Mr. Webb's illuminating address on "The Functions of an Architectural Society."*

Purpose! Wherein do we find in our formal educational effort an expression of purpose which accords with his conception?

Direction! Is our effort directed toward developing in the students those qualities which, as he points out, should be the possession of the architectural profession? Does our method of teaching, the scope and the content of the curriculum reveal an organized program looking toward the development of a vivid concept of what should be the architect's function in a democratic society?

In relation to Mr. Webb's thesis one finds in that curriculum no like purpose expressed, no definite social or democratic goal of endeavor, and nothing in the way of a well-organized plan conceived with such an end in view. We are groping about in a forest filled with an undergrowth of obsolete æsthetic values, economic fallacies, and social prejudices so dense as utterly to confuse us; we have lost all sense of direction.

When a student enters a school of architecture he arrives with his bag packed to the brim with a mass of unrelated facts and fallacies gathered during the greater part of his life in the undemocratic, the unsocial, the unreal atmosphere of what we term formal education. He has been guided by the older generation; he wears blinders; he emerges into the more liberal(?) atmosphere of "higher education," having been told what to do, what to say, and what to think, his powers of judgment and decision rendered sterile by the process.

And then what happens? He is told to face squarely around and gaze steadily back into the past—to Greece and Rome—for there he will find inspiration. Again he begins his march; on and on he goes, never for a moment realizing that his effort takes him farther from his goal. This he does not discover until four years later when he emerges into a confused place of strange forms, a jostling crowd, and new forces—the world of reality.

And again what happens? All that is real—the jostling crowd, the strange forms—to him is barbarian. As his confrères also emerge, they gather together and organize for combat; under the banners of "educational propaganda" and "æsthetic values," armed with "codes of ethics" and "schedules of charges," they march forward to conquer. But the barbarians go on about their business, developing new forces, paying slight heed to the little army marching to the archaic music from the pipes of Pan.

Let us consider this seriously. Let us for the time being drop the subject of the public's appreciation of æsthetic values. As to what we must do to make the public appreciate our

*See the Journal for January, 1918.

effort, let us drop that also. Instead, let us get down to realities and examine the philosophy of education as applied to the education of the architect. Has such a philosophy been formulated? Where is the evidence? Let us check our activities against Dr. Dewey's philosophy, for example.

We discuss without end the cultural value of our teachings. Do we express in terms of action the idea that "any subject is cultural in the degree in which it is apprehended in its widest possible range of meanings"? Do we teach the architecture of humanism in the sense that "humanism means at bottom being imbued with an intelligent sense of human interests"? Do the activities upon which the student is engaged "react to enlarge the imaginative vision of life"? Are we not merely accumulating a miser's store, thinking of our possessions rather than the meaning of the affairs of life? "Any study so pursued that it increases concern for the values of life, any study producing greater sensitiveness to social well-being and greater ability to promote that well-being is humane study."

Architecture should be a humane study. Do we so understand it? Do we so act? Let us see. What is our first step? We turn the eyes of the student back to Greece, thinking that out of the Hellenic circle he will absorb only the beauty of line and proportion. This, perhaps, he does, but he absorbs more, for with that goes the narrow humanistic spirit of the Greeks where the "higher culture was based upon a sub-stratum of slavery and economic serfdom." So on through the "periods" of the past. Consciously and laboriously he accumulates forms and motives. Unconsciously he accumulates sympathy for the cultural forces which produced them. And precisely as the "older humanism omitted economic and industrial conditions from its purview," so does the school of architecture omit those things both as regards the present and the past. The student studies the architecture of the Greeks, let us say. In reality he studies the cultural expression of the class which was in social control. Being told to appreciate a form, his reaction, if it be positive, generates a sympathy for the social order which produced it.

Starting, as we do, with the physical and social standards of the past, accepting merely the aristocratic standards by which effort is appraised, condemning in advance any suggestion that industry may contribute to the cultural advancement of mankind, is it any wonder that the world of reality seems remote and strange?

When we introduce the student to his vocation through the "elements of architecture"—the orders, through the use of forms we instantly narrow his concept of his vocation. From that time on the architecture of humanism becomes secondary to the architecture of form and proportion. Architecture becomes merely the arrangement of things and materials, rather than the resultant of human needs and desires.

And when in our choice of forms we select for models merely the cultural expression of past aristocratic societies, we again and further limit his concept of his professional function to the service of that element in society, the needs and desires of which are associated with the forms with which he has become familiar.

It is not a question of whether or not the classic orders are appropriate structural or decorative elements to use in the twentieth century; *it is rather that their use as an introduction to the study of architecture*, the architecture of humanism, brings immediately into the field of the student's interest a group of associated ideas so diametrically opposed to the democratic tendencies and ideals of the present as to antagonize him to the world in which he lives!

It is the exaggerated emphasis upon the value of these aristocratic cultural expressions in form at the very outset of the student's career which creates the narrow, aristocratic, class-conscious attitude of the school of architecture and hence the anti-social attitude of the majority of the profession.

Our architectural institutions of learning are off in the wrong direction; they are developing an anti-democratic, anti-social profession. It's "right about face," and a fresh start. A tinkering with courses and methods is not sufficient; nothing less than a complete reorganization of effort will suffice. It may be gradual, but it must be complete, for the new world after the war will be a more democratic world.

(*To be continued*)

Letters* from an American Architectural Student in France

July 30, 1917.

We are beginning to have lots of work, and it is steadily increasing—most alarming. Of course it is good for us in the ambulance, but that is a horrible way to look at it, for our work means some man's misfortune. One can hardly conceive the agony of it all. It really is hard to see at a distance—a very short distance at that. And I believe that these wretched newspaper correspondents and war writers are in large measure responsible for a deal of this shortsightedness. They treat something which is almost sacred as if it were a movie or a ball game. Although I confess there was a time when, to use slang, "I fell for it."

I suppose that it was entirely different at the beginning and during the first year of war, which I was not fortunate enough to have seen, when nobody knew at all what was going to happen, and there were the elements of adventure and romance and old-fashioned soldier spirit connected with it— a great deal of the latter, I presume. Before this, wars meant individual suffering, heroism, dashing bravery, overwhelming joy in case of victory, and the fortunes of war to be accepted in defeat.

But this is so immense and so vastly far above our poor human heads that one is indeed fortunate who has the privilege of being able to imbibe a small bit of it. It is an entire nation menaced by the gravest calamity—that of being reduced from one of the first countries to an ignominious position of dependency. And the whole nation has been fighting, not as a conquering army filled with the glory of victory, but rather a nation fighting a victorious fight and filled with the glory of an ideal. But it is hardly fair to call it a victorious fight, for it has cost them dear, very dear. And often the end seems so far off, and occasionally becomes obscure, and the black cloud of "Kultur" looms ominously.

However, it seems to me inevitable that the end will be in our favor. If people would only realize what France has done and how very much the world owes her. Really, we have not the slightest right to hold up our hands until we have paid them back several times over.

The "Red Badge of Courage" is not such a glorious sight as many imagine. Wounds are painful and not overpretty; guns make a noise that splits one's eardrums—not a noise that gives one that curious elation prevalent at "Star-Spangled Banner" meetings; refuse smells and vermin bites; the rain is wet and cold and mud is depressing and food is food and needed, and it is not very exciting to starve in the cold and wet, nor is it very "picturesque" either, but rather disagreeable and disheartening. Yet these people fight on with the best of them under the earth. Germany can pay back much, but can she ever restore to France that youth and blood of which she so arrogantly deprived her?

One has but to see soldiers going up to the trenches to have the whole past three years brought to light in a nutshell. It is indescribable. They do not go up with the spirit of conquest nor, on the other hand, like scared children, but they are men who know what is ahead of them, and there is no novelty in it for them. One can read on their faces (for Frenchmen of all classes have expressive faces) a determination, not necessarily grim, better call it earnest—"grim" is too hackneyed and has lost its force.

But the coming back is in a way the worst part—many stay out, turning into part of that drab landscape of "No Man's Land" and becoming offensive to their fellowmen and own immediate comrades. "Heaps of dead" are not thrilling objects, except in story-books. And the men who come back in whole skins are pretty well played out, but of course the relief acts as a good tonic. However, they soon realize that relief is only temporary, and the whole business will have to be gone through with again.

Then there are those who return from the trenches wounded. Some are lucky and get off with light wounds which are comparatively of little physical importance and afford the owner an extended "permission." Others are grateful when their wounds are of such a gravity as to prohibit them from further military duty, without their being too painful. Those are the wounded most heard about —the ones that give the romantic dashing element to warfare.

But then, if the people at home could only once see a real "grave blessé!" There are no lovely ladies to hold a heroic hand whose owner's head is bound up with the proverbial red-stained rag. Usually there is a rather choleric doctor, fed up with three years of it, who pours burning iodine on the living flesh, inflicts another wound with his anti-tetanus needle, and pins on the little "fiche," thoroughly cataloguing the man in a most prosaic and businesslike fashion. How hard-hearted one becomes working with the wounded—there are so many of them!

When the work is light it is different, and one can give individual attention to them—talk to them, try to cheer them up a bit. But when the work is heavy, and they come pouring in, it is a different matter; each one is just like the other. And along toward morning, when it is cold and wet, and you have been hauling them all night, their groans and cries of "oh la" and "à boire" begin to get on your nerves. But, after all, you are only an "ambulancier," while they have been soldiers of France and have a right to yell in their agony.

Many people still seem to think that working among the wounded means holding a glass of water to some parched lips with one hand and stroking a handsome brow with the other, with the shells bursting around, none of which, of course, touch you at all. I am not cruel by nature, and to see wounded does not inspire me with anything but pity and admiration, but you must realize that they have no time here at all for cheap sentiment and a "blessé" probably prefers to be comfortably fixed in a safe hospital rather than to be pitied and made a fool of—and the quicker he is gotten there the better.

The work in this section seems to me to be somewhat

*The letters of Edmund Randolph Purves began in the issue of November, 1917.

different than that in the other place. It is more dull and yet, in a way, more exciting—harder and yet easier, and, for some reason, more gruesome. The country has been so intensely fought over that it is more or less like a strange land into which we make regular trips and never fail to come back with our load of human freight. Although we cannot see the lines on account of the hills, yet we have a feeling that we are very close to them out at the posts, and I have no doubt but that we will soon have a very clear view of them—perhaps too clear for comfort.

There had been a great deal of shelling the other day, and when I was up at the poste I asked the doctor if there had been any result from it. He simply nodded, led me to a shed, and pulled aside the blanket that served as a door. There, lying on the earthen floor, were five bodies, all shot to pieces—the men who carried the food up to the trenches. It is of great advantage to prevent the enemy from getting his food, for a hungry soldier is a poor fighter. There seem to be a great many more dead in this section—at least they are more in evidence—and it is not seldom that dead men are taken out of the ambulances that come in from the front-line postes and hurried across to the morgue, always with a blanket over their faces. The dead are never put into the ambulances, but quite often men are so badly wounded that they die en route.

So far I have seen no men wounded by rifle bullets, except those bit by machine guns, which inflict about the same sort of wound, only there are apt to be more of them.

They brought in a "gassed" man a few days ago—the first one I have seen. He appeared to be all right, except that he coughed incessantly. He was conscious, however. He had a very light case and only got, perhaps, a few whiffs. They say that it takes about three to five breaths of this new gas to suffocate, and that it is odorless and invisible. That, probably, is somewhat of an exaggeration. At all events, I am not very keen about running into any of it, and hope that I will never actually need a gas-mask. I have only worn one once, and then it turned out to be more or less of a false alarm. I have seen gas-shells come in, but, luckily, I happened to be to the windward of them and was perfectly safe.

Last week the German aviators came over and dropped notices saying that they were going to bombard two of the towns nearby. They did, too. They never fail to carry out their word in cases like this. Back in the other section they used to give notice about a week ahead of time whenever they were going to bombard a certain large railroad base. They were rather punctual, too, and generally got away with it.

One of the most amusing sights I have yet seen here at the front I saw the other day. We were returning to camp, when, coming around a corner, we saw ahead of us a gendarme on a bicycle and beside him trotted a German prisoner, a rather nice-looking chap who was continually smiling to everyone he passed. None of them seem to object to being prisoners, as far as I can make out. It really was funny to see this Boche hurrying along and evidently enjoying it.

August 7.

We leave camp about 11 o'clock in the morning, after a hurried meal in which we eat just as much as we possibly can, for it is a long wait until supper. Food is almost the most powerful projectile there is! We then drive some four miles to a little house at the brink of a canal and wait there until it becomes dusk, the wounded being brought down to us by boat in the daytime. As soon as the twilight shows signs of giving out, we go on up to the "poste" itself. It is a distance of about three kilometers of the meanest driving possible. Imagine the worst traffic you have ever been in, a dark, cloudy night, and no lights anywhere, except star shells—unfriendly ones usually—and you have an idea of what that road is like. To make it more interesting, there is one of these little narrow-gauge trench railways running along either side of the road. A trench train is a formidable thing to meet in the dark. The other morning I was running behind a convoy, in a heavy cloud of dust, and, when it settled down, I found that I had been going with one wheel between the rails. It is wonderful how few accidents there are on the road—not as many as one would find in ordinary city traffic.

The "poste" is in the middle of what once was quite a little village. There is no village any more—one house alone stands, and that one in a poor state of repair and not now worthy of the name of house. On the other side of the village is a low hill, and on the other side of that are the Boches—so near and yet so far. Owing to the contour of the country, we are never in view of the lines in this place, but we are quite near and are in plain sight of their observation balloons.

The night I am speaking of, the Boche had spotted a hand-grenade depôt and had put a well-aimed shell in there which took its toll of human lives. As we entered the town in the growing darkness, we passed "brancardiers" pushing the little two-wheeled stretcher-cots as fast as they dared over the rough roads. That shell certainly created enough havoc. Many died on the way to the "poste," and few got off with light wounds. Some of the "brancardiers" seemed to hold only a bundle of bloody rags; on some, the white faces stared up at the faint stars with mouths shut tight in silent agony. It was an uncanny sight, these little "rickshaw" arrangements creaking through that blasted village, each with its single load of maimed, blood-soaked humanity, while over the hills the star shells rose and burst "sans cesse" and the guns growled and the caissons went rumbling on and the foot-soldiers stolidly plodded past, pipe in mouth, gun slung over shoulder, stabbing the mud with their sticks and heaping vile epithets on the luckless driver who forced them into a ditch—a typical evening scene back of the lines.

Upon reaching the "poste," which consisted of a well-made "abri" of corrugated iron semi-cylinders covered with masonry, I went in to find out how many wounded there were to carry, which is rather a matter of form. No doctor appeared on the scene, and, upon entering, I saw the room literally crowded with wounded-bad stretcher cases mostly. It was a pitiful picture—the whitewashed interior of this corrugated iron tunnel, throughout the length of which men lying, head to feet, stretcher after stretcher. Innumerable they seemed, though there could not have been more than fifteen. A lonely flare placed at the near end lit up the place and flickered dismally in the fetid draught which slipped through. About half of the men on the stretchers had already "gone West," their

glassy eyes staring toward the lines, and here and there among the stretchers one could faintly hear the "oh la la!" which means that a Frenchman is really suffering.

It was not long before I had a load, carrying three stretcher cases in back (two officers and one private) and a sitting case on the front seat. One poor fellow had his foot (among other thing) blown clean off and bled profusely, and I did not have time to clean the car afterward, so that it smelled fearfully. Blood does really smell—a pungent, nauseating odor. I had doubted it in books, but I know now. The fellow on the front seat had been almost buried alive for three hours and had lost a deal of skin from his chest, but was quite cheery and very talkative.

The work continued right along, and, in the morning, after it was over, and we had come back to the canal bank, I tried to snatch a little sleep by lying across the driving-seat of the car. I had tried putting a stretcher on the ground to sleep on, but the rats thought it was for their benefit, so I gave up that idea. A "brancardier," seeing me draped on the seat in a most uncomfortable position, insisted upon my having a decent bed. I could not refuse (it is almost impossible to refuse anything in this country); he would not think of it. Murmuring something about the outrageous way they treat the hard-working drivers, he took me into his shack, which was scrupulously clean and white-washed, and showed me into his bunk, a most splendid contrivance with a straw mattress and springs and warm blankets. There was a time—and not so long ago—when I might have hesitated to share the bed of a peasant from fear of the lurking evil within the folds. But this time I was really sorry for his sake, for I was terribly muddy and somewhat "cooty" (buggy). When I mentioned the fact to him, he said, "but you are tired," so I lay down, and he tucked me in (he was a fatherly old soul), and soon I was sound asleep, dreaming of Chestnut Hill, and when I woke up I congratulated myself on being where I was and doing what I was doing.

Speaking of the good old-fashioned flea—more than one have been with me for the past three weeks. They are really not a bit bad when one gets used to them, and I am sure that if he or she leaves me I shall be desolate. They get to be part of one, you know.

That clipping apropos of ———'s speeches was very interesting and true in a good many respects, but showed that even those in authority do not always know what they are taking about these days. I contend that an Ambulancier *does not* need to be as strong a man physically as a soldier. The only strain is a nervous strain; the physical hardship business is a joke. One gets rather tired, but it cannot in any way, shape, or fashion, compare with the fatigue of a soldier. Moreover, his statement about the mortality in the aëroplane and field artillery services being so great shows his ignorance about actual conditions. On the western front the infantry suffer the most, far more in proportion than any other branch of the service; the brancardiers and trench-diggers and supply men probably the next, but far less than the infantry. Flying is as safe a job, pretty nearly, as driving an ambulance, and the artillery, especially the "heavies," is about as entertaining a job as working a steam riveter in a boiler factory, and much safer. Most of the casualities in the flying corps come from mismanagement of machines and poor flying. One naturally thinks the aëroplane service so dangerous because they always print the numbers of machines wrecked in the "communiqué." If you could see the casualty list in the English papers you would see how things stand. . . . . The Germans do not shoot at ambulances; they cannot afford to waste a shell on them, but quite often ambulances have to pass through places and along roads that are being shelled.

I suppose that you have heard by this time about Jack Newlin. It was a great shock to all that knew him. About ten days ago he came over and had dinner with me, being with a brand-new section that had just come out to this sector. He had had one trip on their beat, was very enthusiastic over it, and quite keen about the work. Several days later he went out again and was blown to eternity by a shell which landed under or near his car. (I do not know the details of it all.) I believe that it was what is called a "stray shot," and happened some way back, although I may be entirely mistaken about this. It is the first time anybody that I have known has been killed in this war.

August 11.

The other day I had two rather interesting passengers. The first was a slip of a freckled-faced boy, younger than myself, whom I had carried once before, back in the other sector, now evacuated. He recognized me and I recognized him, so I put him on the front seat, and he told me all his troubles. He came from somewhere on the coast and had been turned down at first on account of his weak physique but was finally taken. But his soldiering did not last long; he was soon sent to the rear with intestinal trouble, and now again, after two or three weeks at the front, he was sent back for the same reason. He was rather relieved to be out of it, but hated really to have to go, as he was full of spirit, and said wistfully that he guessed that he was not cut out for a soldier. I do not think he was either, as far as the physical part of it goes, but there was nothing "yellow" about him. He presented me with his bayonet as a souvenir.

My other was a little colored fellow who looked very comical with all his equipment as he moved along. His little round black face (about the blackest I have ever seen), half hidden by an enormous tin hat, looked like a large polished black button, and part of his equipment as the whole mass—overcoat, haversack, bayonet, rifle, and canteen—came clattering along. He sat on the front seat with me, and, thinking that he was an African, I timidly asked him in French what Division he belonged to. His answer was in English—good English, not Uncle Remus dialect, but a clear curious kind with a strong foreign accent. He informed me with pride that he was from the West Indies—from Guadeloupe—and not a Senegalese. He was very proud of his French education and could speak three languages, French, English, and Spanish. He said that he had learned English at school but had perfected it at Panama, where he had worked *with* Colonel Goethals on the Panama Canal, driving a steam drill. Colonel Goethals was his ideal man, in fact, in his estimation, the Americans were great fellows, but he said that they should have been in it long ago. They all say that

over here, even the Indo-Chinese coolies. That is a fact. This poor man had not had a leave since he had come over, and wanted to go back and see his family once again in far-off Colon. These colonial troops must actually suffer from homesickness. I shook hands with him and wished him good luck, which seemed to please him, as I do not believe these fellows are much fêted, and their billet is no bed of roses. They do a large part of the fighting and come in on very little of the glory, and one can imagine how the Boche must treat them if they catch them—but they seldom do. These fellows die fighting.

There are a great many foreign soldiers about here, mostly from Africa and Senegal. The Africans are coal-black men with rings in their ears and with names that recall the queer, mysterious African lakes and rivers. They are rather big and brawny junker-jawed, with great lips and scar-patterns on their faces, and are not very intelligent looking. Beside their regular equipment they carry great flat knives (machétes) with which they do most of their fighting. The Senegalese are about the same, but have narrow, slanting eyes, sharpened teeth, and most inhuman faces. Little wonder that the Germans run at the sight of them. The Moroccans are yellowish men and make wonderful fighters for hot action, but they go to pieces when forced to sit tight.

It was the stolid British ability to sit tight and their bulldog tenacity which kept the nation on its feet during that first frightful year.

News Notes

The Italian Military Medal for Valor conferred on Mr. Guy Lowell. According to press dispatches, the Italian Military Medal for valor has been conferred upon Mr. Guy Lowell, now serving with the Red Cross on the Italian front.

A New Book on Housing to be Published by the Journal

"The Housing Problem in War and in Peace" is the title of a new volume to be issued by the Journal and now on the press. It will consist of the articles which have appeared in the Journal under the title "What is a House?" and will be illustrated by photographs and plans of the various types of small houses built in England during the war, and with plans of the villages of Eastriggs, Well Hall, Queensferry, Coventry, and Glengarnock. There will also be included plans and elevations of other buildings, and the material on the work of the Massachusetts Homestead Commission and the small-house reconstruction work in France, both of which appear in this number of the Journal. The price of this book will be $2, and it is already evident that the first edition will be exhausted in a very short time. A special notice concerning this has already been mailed to members of the Institute.

Two Volumes of Proceedings Desired by the Institute

For the purpose of completing a special file of the Proceedings of the Institute, the Secretary of the Institute would be grateful for the donation of either one or both of the volumes for the years 1876 and 1886. Members in possession of either or both of those volumes and willing to make them available for the Institute's files are requested to correspond with the Secretary.

Small-House Reconstruction in France*

IF THE attention of those interested in housing in the United States has been almost entirely concentrated on the housing undertakings of the British Government, it must not be thought that France and Belgium are not deeply concerned with their own problems. In the former, nothing but plans are now possible, but these are being studied in the broadest way, and there need be no fears but that the reconstruction of Belgium will proceed along lines informed with the lessons of the past. It is perhaps worthy of chronicling the fact that extensive studies for the rehabilitation of Belgium have already been made by the German authorities, and the preliminary proposals, at least in part, have been issued in printed form. But the world will still have something to say about this!

In France, the loss of the iron and coal areas resulted in a temporary industrial depression, with a consequent expansion in England, where the burden of war production fell with compelling force. Thus the French were not faced with any such housing problems as arose in England. The restoration and expansion of the war-making industries in France was a gradual process permitting readjustments which were not possible in England, nor, as experience has so painfully demonstrated, in this country.

Much temporary reconstruction work has been done in France where there developed the imperative necessity of rehabilitating the reconquered areas which had been devastated by the

*From the French of Henri Lavedan in "L'Illustration."

enemy. But the future will require an immense amount of study and a vast expenditure. To the excited few in the United States who have so mistakingly assumed that the problem of reconstructing France was one that should be left to its lovers in this country, there may eventually come a perception of the fact that France, architecturally, is able to care for her own interests. The illustrations which accompany this article are in themselves the best of evidence as to whether the authorities and the architects of France are capable of approaching their problem in the proper spirit, and if further testimony were needed, perhaps it may be found in the appreciation by M. Henri Lavedan, a translation of which should be given the widest circulation possible. In it there dwells a perception of the housing problem which is so illuminating and so revealing—so profoundly touching in its humanity, so inspiring in its delicate message to those who face this question in other lands—that it might almost be said to constitute the basis of the human and the esthetic approach to the home. Other factors enter in, as we know, but it is only through an intelligent blending of all the various phases that there will be laid the foundations of a stable national life—if we admit that this must, in all cases, be founded and maintained upon the home. There need be no fear but that we may look hopefully to France for a contribution worthy of her great sacrifices, her noble intelligence, and her will to live. The article by M. Lavedan, to which we refer, is as follows:

Since the commencement of this year 1918, when there was affirmed with so much energy the confidence, the hope, and the faith of French hearts, there has been accomplished, quite apropos, a vivid demonstration of our will to live and to prepare without delay for the immediate future.

As is well known, a competition* was held "for the reconstruction of the rural habitations in the liberated regions," and the Museum of Decorative Arts exhibited in its rooms, until the first day of February, the drawings, chosen from very many, that were deemed worthy of special mention and of possible adoption as the types of architecture appropriate to the regions, to the circumstances, and to the necessities of the future.

The exposition is both the proof and the fruit of a unanimous motive, of a touching and scholarly effort. We do not doubt, however, that the public went there, influenced not only by a sympathetic curiosity but by that active desire and by that generous impulse which impels us, each in our sphere and according to our abilities, to compete in the great work of general reëstablishment, of universal reconstruction. It can be well said that, without active participation, we shall contribute nevertheless to the success of the common enterprise by the cordial interest which we shall have shown. We shall contribute our foundational stones, invisible and real. In these questions, the warmth of public opinion is precious and of a communicative strength that nothing equals. It alone can create the torrent of zeal that goes straight to the goal and carries away all the obstacles.

The first impression of this exhibition, which is not once changed during the length of the visit, is instantly complete. The eyes and the spirit find in it their charm and their profit. I well know that the majority of those who passed through to look at these drawings preoccupied themselves less perhaps with their practical value and the conveniences that they offer than with their picturesque exterior and the bewitching aspect that they present. No matter. It is not necessary to possess technique in order to understand the very special conditions that the program demands, and the way, so often fortunate, in which, in different degrees it has been studied, grasped, and visualized by all the competitors.

It was not a question, indeed, of considering the rebuilding of amusement resorts or the country villas of the middle class. These, without doubt, have known as much as the others the destructive rage of the invader, and the moment will also come to determine to rebuild them in the same spirit of local and reasoned adaptation, the source of inspiration of all the good workers of the rebuilding renaissance. But the first to be considered was the most urgent —the primary and indispensable requirements of existence. The necessities of nourishment, of cultivation, of manual labor, the discipline and conditions of life itself clearly indicated and limited the immense work.

Bread made necessary the oven, and flour, the mill. The fields, no sooner cleansed and put back to a normal state, would demand the farm buildings; and everything depending on the sun and the earth, both beasts and people, would desire the roof and its shelter. The first scheme was thus naturally indicated. The inn, the bakery, the café, the smith's forge, and, above everything, the houses of the peasant, of the farmer, of the rural worker; such were the humble and sovereign edifices to be first erected, the pillar and support that should be determined and placed, the nucleus around which would group themselves afterward, little by little, in the near and far-distant future, the different and successive elements of the resurrected village. What task more important than the careful and studied reformation of all these cells, broken and obliterated! What noble attraction, what magnificent stimulus did the difficulties themselves present! No! That was not an ordinary competition, one of those cold and common tests that concern but the hand and the intellect and leave the heart a stranger. It has been absolutely necessary in this case, that, in order to succeed, the heart should aid the mind and direct the hand.

All of these drawings, the best as well as those that do not attain perfection, nevertheless permit to appear clearly the tender thoughts of their authors. In addition to their remarkable merit, they are the stirring acts of

*In the preliminary competition there were 1,498 entrants; in the final, there were 340, of whom 270 were soldiers.

patriotic piety. One may perceive the leaven of the most exquisite solicitude at the same time that one is surprised at a kind of divination with which a number have understood and penetrated the character and spirit of the district to be restored. Neither mistake in taste nor mistake in tact. Nowhere does one find any sentimental heresy.

I admired at every instant this comprehension, so unerring and so correct. "Why," said I to myself, "it seems that these young architects never lived anywhere but in the country and in that part of the country which is the object of their study!" And it is also an object for inquiry, when one sees the precision, the confidence with which some have placed and distributed the farm buildings, whether formerly they have not been innkeepers and agriculturists.

No, that was not necessary. It was sufficient for them, knowing their trade, to be soldiers, to have seen and experienced the ravages of war. The sight of the ruins was in itself capable of suggesting to their intelligence, moved to pity, the most suitable way to reconstruct. They have learned "on the job" that the new habitation can not be well erected except by considering, respectfully, the ruins. A great number of these young men are in the army. Their ideas were conceived in the trenches, under canvas, within sound of the cannonade. In order to germinate, their ideas, like seeds, had to be put first in the earth, in the bottom of the hole dug for them. Being in the foundation ditches, they placed the piers. The air, earth, and climate of the regions where, in a close intimacy, they were forced to prolong their sojourn, informed and impregnated them until they were native to the locality. In working at the resurrection of the particular corner of France, destroyed beneath their gaze, they obeyed with fervor a sentiment of individual and filial gratitude. This is the reason why the plans were conceived and executed in a will so expressive of duty and love.

It is impossible to mention all the names of those who have devoted themselves to the work of salvation, but permit me, however, to draw special attention to M. Pierre Sardou, government architect, who no longer can count his successes. In the army since the beginning of the war, he obtained first prize for his "House of a Rural Property Owner." How charming and practical it is, this modest and solid home, all on one floor, with its wall in natural stone color and its brown roofs. Tied to the past by certain motifs, sober in line, of a good, frank rusticity, hospitable and well protected, it constitutes on the side of the road of life the ideal shelter of peace, of labor, of repose, as well made for living therein a long time as for there dying in the calm and the satisfaction of a beautiful evening.

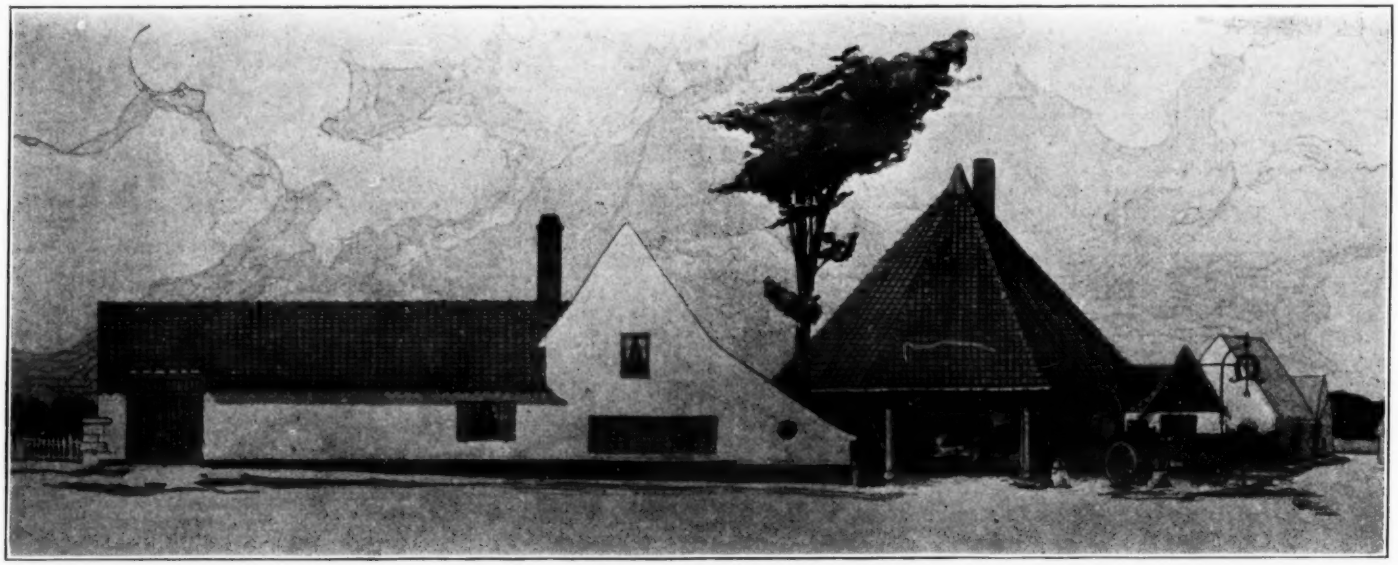
Mr. Bonnier, an aviator, also winner of one of the first prizes, has found time between flights to realize the captivating idea of Flemish farm buildings, of which the very finished model gives us a delicious impression. With its roofs loaded with snow and its little windows lighted in the night, it looks like the setting of a Christmas tale. And, really, in the most profound meaning of the word, does it not concern the human and national nativity? And the habitation of the blacksmith, as the likeness is engraved by M. Pierre Patout, treated in old timber work, is of the most cordial and ample attraction. What a magnificent framing of this robust shed in the style of an ancient market-house! At the very sight of it one hears the song of the hammer, and the perfume of the scorched hoof rises in the air. Many others, who will excuse me, should be noticed. All, in designing houses, created poems, ballads of the new era, in which occur reminiscences of the past. Yet adapted, with a light touch, to modern formulas, they have gathered and continued the traditions of the old provincial architecture, and this religious anxiety that guided them lends to the ensemble of their researches a ravishing harmony, a family resemblance.

And it is also a song of action and grace, which under a serene sky, among reborn orchards, over the breathing village, declaims the cheerful and youthful house with roofs mounting to happiness. Oh, the touching promise of the Alsatian chimneys, columns having for bushy capitals the nest of storks! Thus the ruin, alas, when forgotten, seems already to belong to ancient history. The stones of mutilated France have changed their voices. Yesterday they were weeping, today they sing.

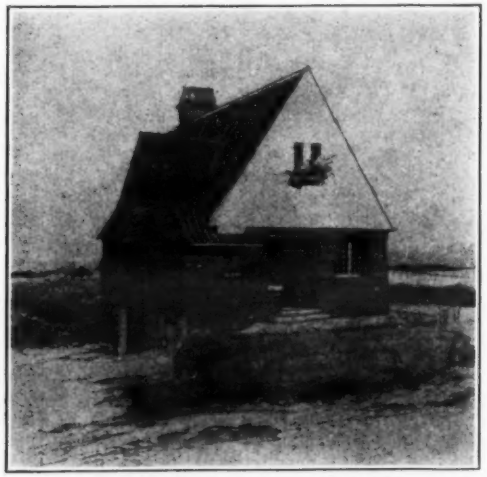
But on the day, when to the repatriated will finally be given over the pleasant and fair dwellings newly adorned, how necessary it will be that those who there take up their abode shall endeavor to feel their charm and their moral value, all that they hold of devotion, of sacrifice, of *right*, all the loving attention and anxious maintenance which they demand. These are sanctified houses, uncommon, beautiful, and it will be an impiety to allow them to decay and deteriorate. It is therefore necessary to care for them, in order that all the good artists, who conceived them and offered them to their native land in so fine a spirit, may not in the future have heavy hearts, finding them vilified, misunderstood, and soiled. A great and useful education to undertake, and one which will forge to the front as one of the pressing needs of tomorrow.

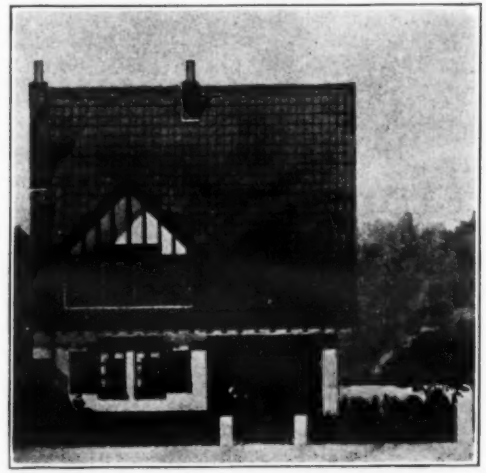
This vast and compelling question of the reëstablishment of our devastated provinces is an inexhaustible thing. The depth of its perspectives extends in every direction. I have only been able, to my great regret, to put down in passing some reflections on morality, and, forced to terminate, I perceive that I have said almost nothing. Fortunately, others better prepared and instructed, of a more scholarly technique, and prepared by conscientious study, have set forth and treated in all its aspects the problem that in this article overwhelms me. I can do nothing better in concluding than to recommend to those of my readers desirous to inform themselves more fully the excellent work that, under the significant title, *"The Homes of France," has just been published by M. Léandre Vaillat, apostle of this fundamental thought—each locality its characteristic house. He was one of the first and devoted organizers of the great movement of which we can appreciate today the precious results. Composed of serious studies so favorably mentioned in "Le Temps," the book, written by a learned and refined artist and a charming writer, is the most agreeable and scholarly labor consecrated to this great work.

*The text and illustrations of this work were published in the Journal of August, 1917.

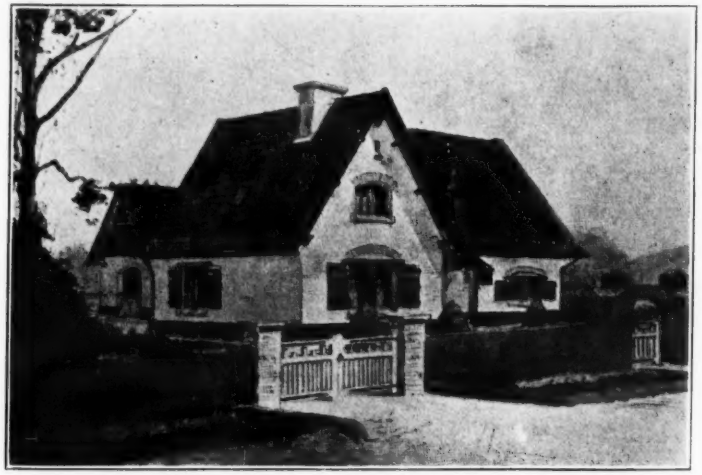


Blacksmith's House in the North (M. Pierre Patout)



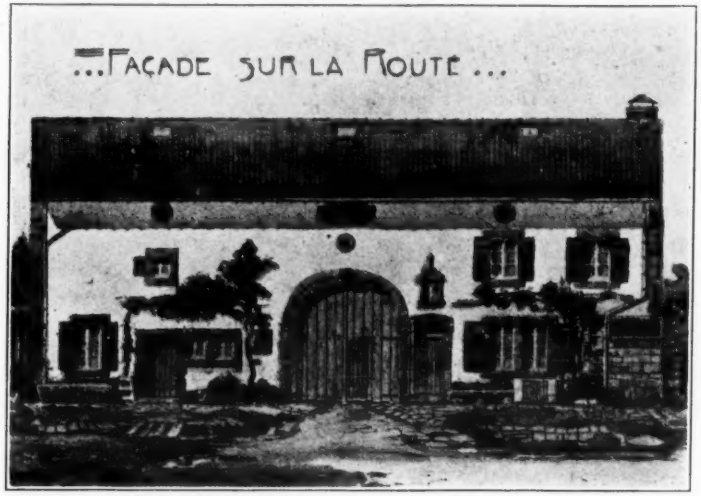


Three Houses for Factory Workers (M. Goupil, MM. Coutan and Robida and M. Maxime Adam)



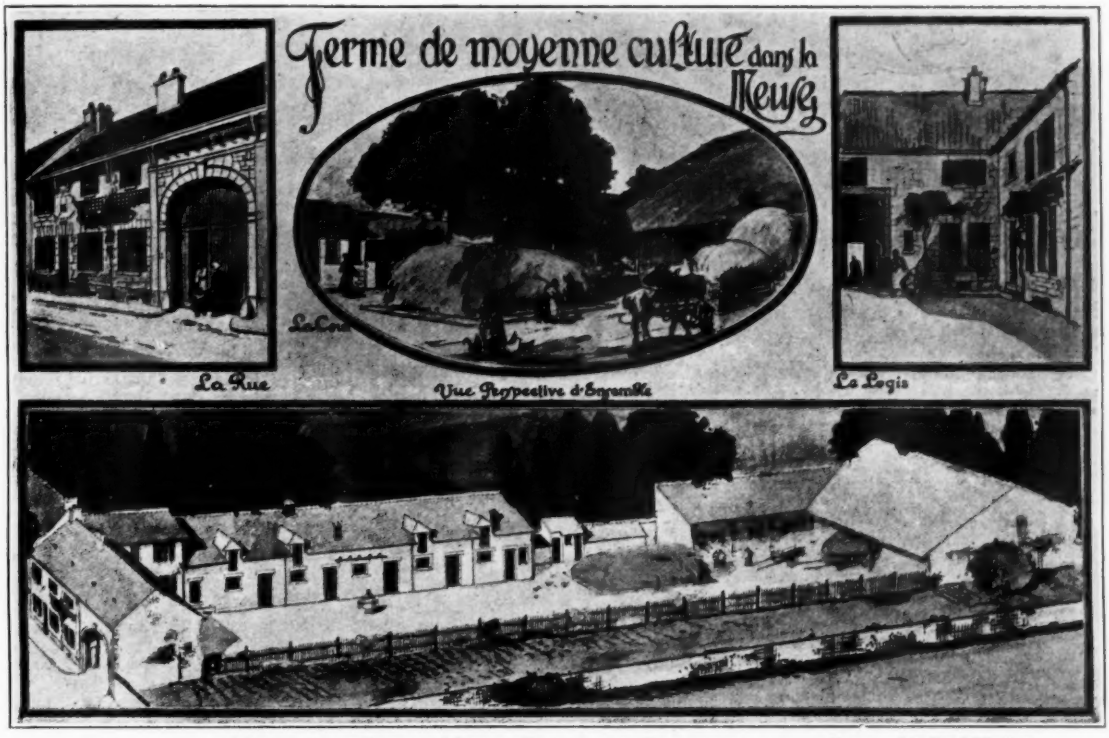
House of a Rural Property Owner in Artois (M. Roger Poyé)

House of a Rural Property Owner in Aisne (M. Pierre Sardou)



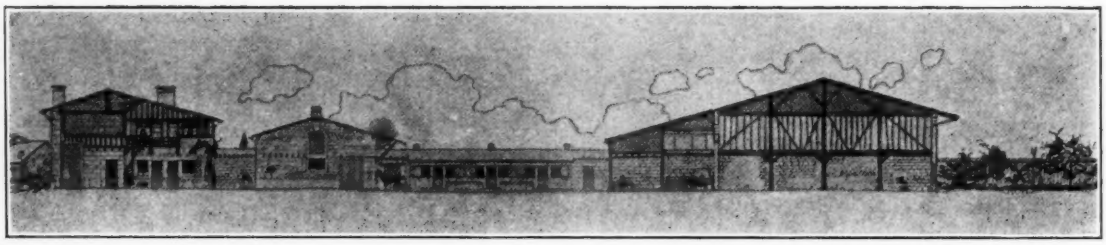
A Small Peasant House in Vosges (M. Jankowski)

A Small Peasant House in Meurthe-et-Moselle (M. Maurice Stein)

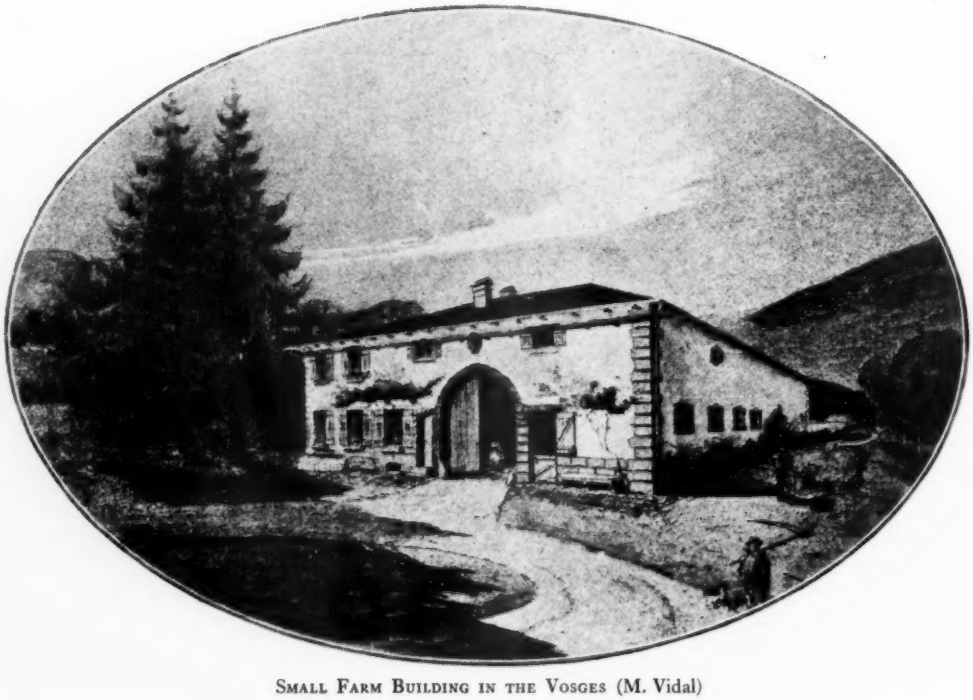


Buildings of a Medium-sized Farm in Meuse: Details and Perspective of the Group (M. Paul Tissier)

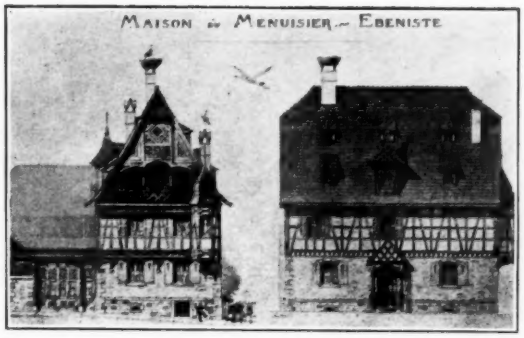
Farm of Twenty-five Hectares in Pas-de-Calais (M. Sirvin)



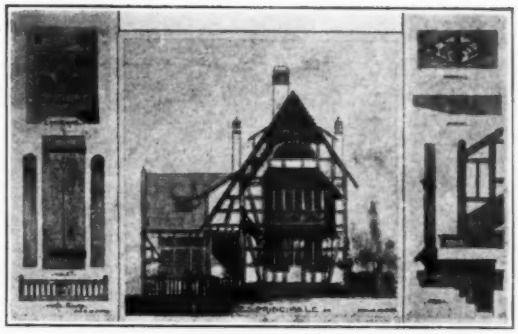
Farm Buildings in Meuse: Longitudinal Section of the Buildings Arranged in the Depth of the Lot (M. Leprince-Ringuet)



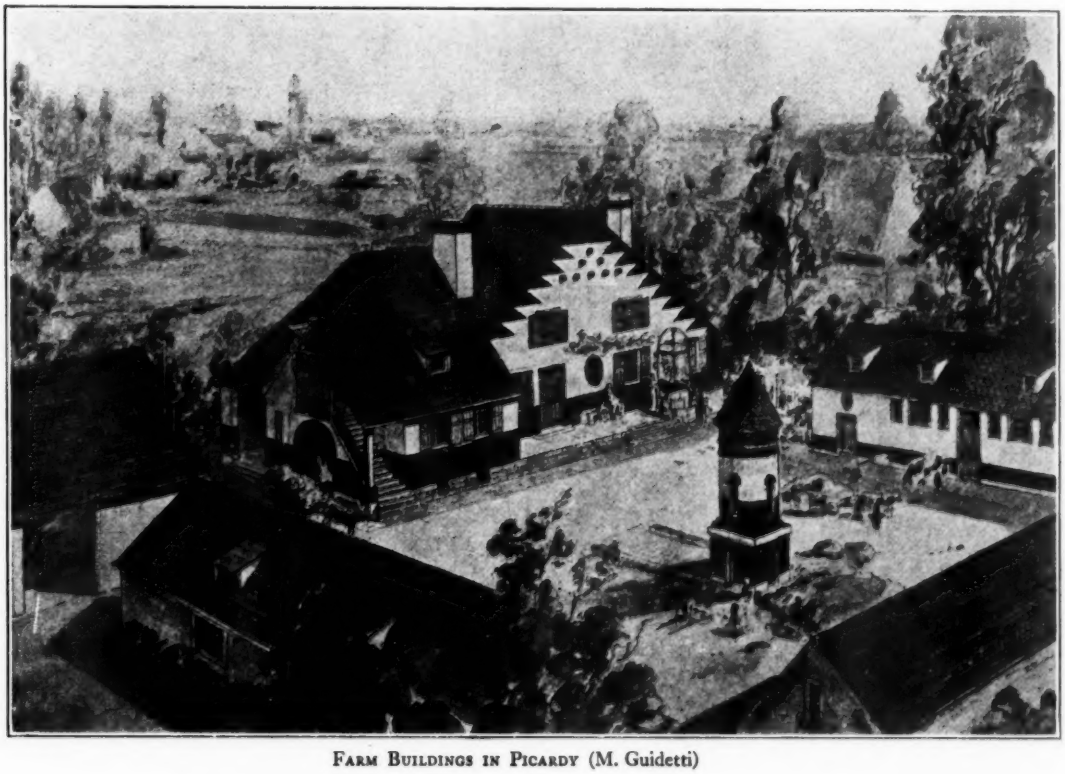
Small Farm Building in the Vosges (M. Vidal)



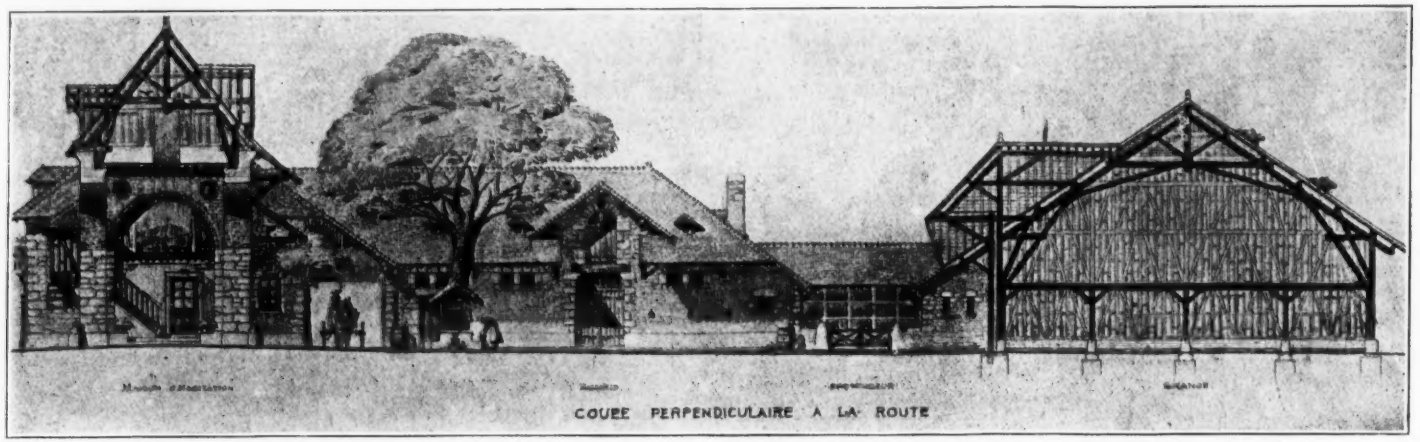
House of a Cabinet Worker in Alsace (M. Eschbaecher)



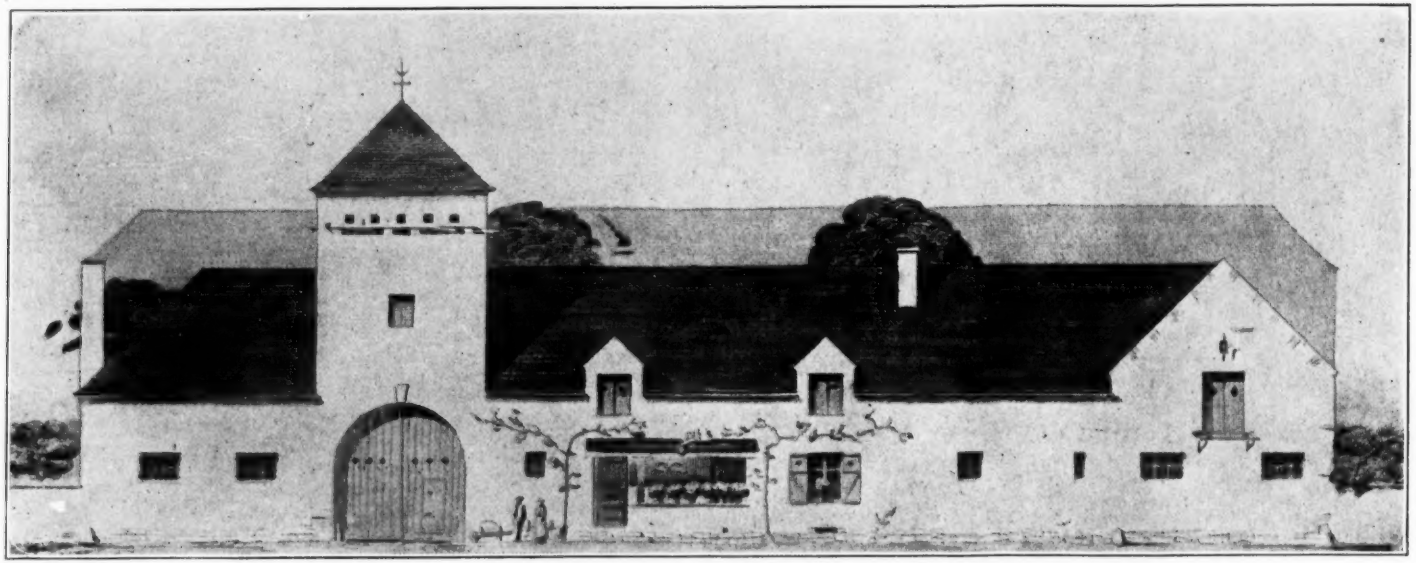
House of a Locksmith in Alsace (M. Dory)



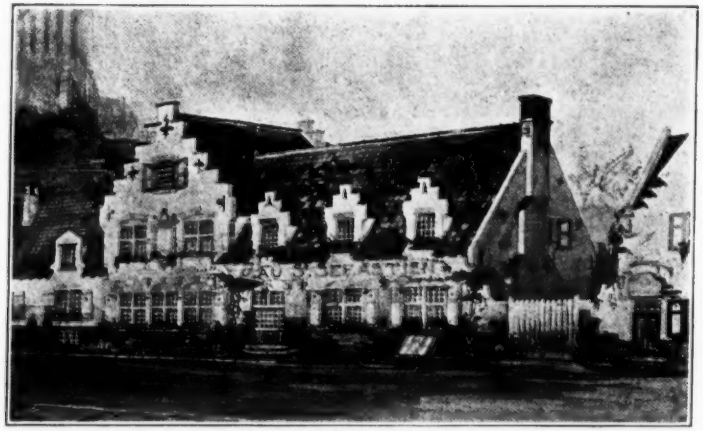
Farm Buildings in Picardy (M. Guidetti)



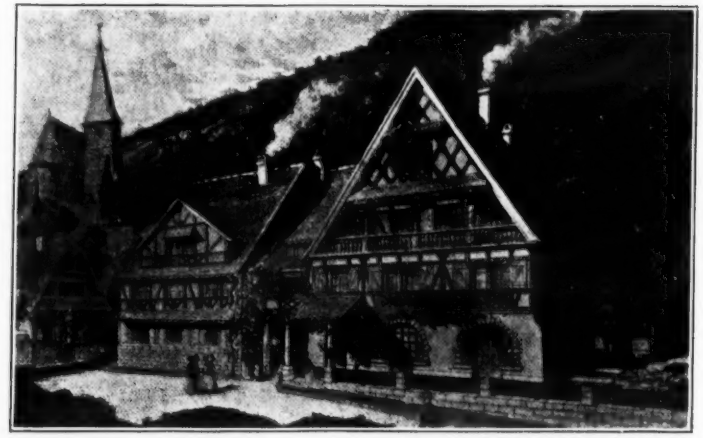
BUILDINGS OF A MEDIUM-SIZED FARM BETWEEN THE SOISSONAIS AND THE CHAMPAGNE: SECTION PERPENDICULAR TO THE ROAD (M. Midy)



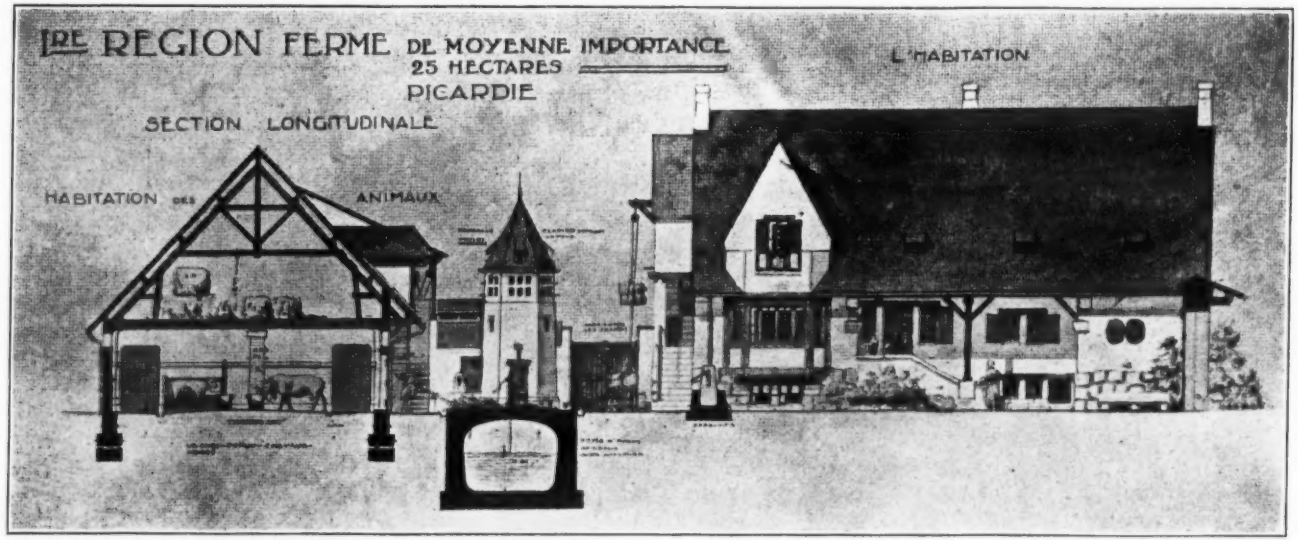
FARM BUILDINGS IN AISNE: ELEVATION ON THE ROAD, SHOWING SMALL PORCH (MM. Duval and Gonse)



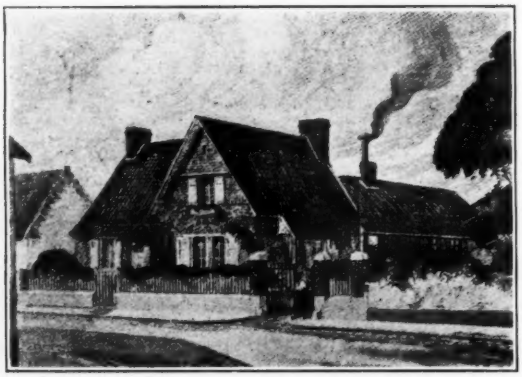
Tavern in the North (M. Barbotin)



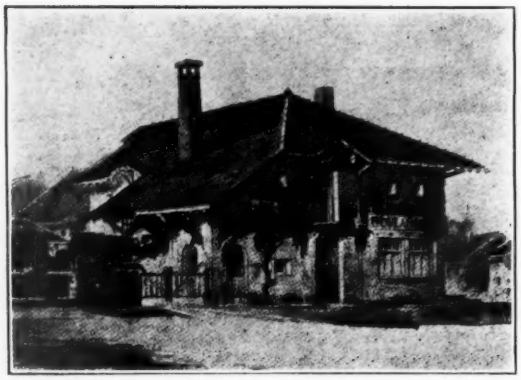
Village Inn in the Mountains of Alsace (M. Lambert)



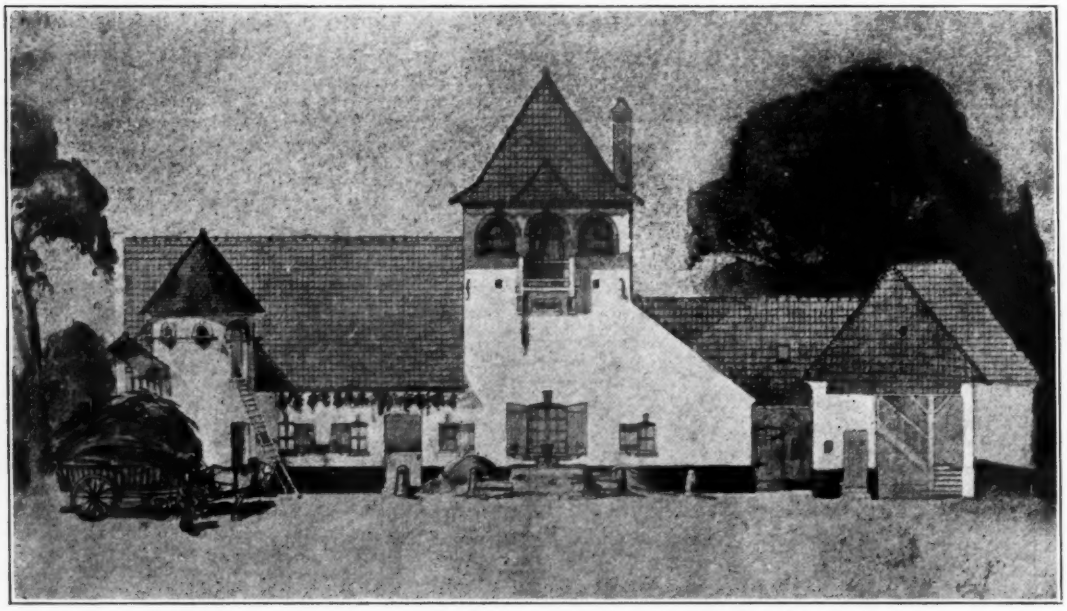
Buildings of a Medium-sized Farm in Picardy: Courtyard Elevation of the Dwelling-House and Longitudinal Section through the Stable (M. Anselmi)



House of a Locksmith in Artois (M. Despeyroux)



Baker's House in Meurthe-et-Moselle (M. Bois)



Farm Buildings in Artois: Elevation on the Courtyard (M. Mulard)

Housing by the Commonwealth of Massachusetts

IN 1912 the Homestead Commission recommended that the uncalled-for savings-bank deposits in the state treasury be used for an experiment in housing. Such use was found to be unconstitutional. The Commission was then influential in securing an amendment to the Constitution, ratified by the people of the Commonwealth on November 2, 1915, providing that "The General Court shall have power to authorize the Commonwealth to take land and to hold, improve, subdivide, build upon, and sell the same, for the purpose of relieving congestion of population and providing homes for citizens; *provided, however*, that this amendment shall not be deemed to authorize the sale of such land or buildings at less than the cost thereof."

The Commission then renewed its recommendation for an appropriation, asking the Legislature for $50,000. The bill was defeated, but on the following year the sum was granted, and the Commission proceeded to apply it to a practical experiment in housing. The act follows:

An Act to Authorize the Homestead Commission to Provide Homesteads for Citizens

Section 1. The Homestead Commission is hereby authorized, by and with the consent of the Governor and Council, to take or purchase, in behalf of and in the name of the Commonwealth, a tract or tracts of land, for the purpose of providing homesteads, or small houses and plots of ground, for mechanics, laborers, wage-earners, or other citizens of this Commonwealth; and may hold, improve, subdivide, build upon, sell, repurchase, manage, and care for said tract or tracts and the buildings constructed thereon, in accordance with such terms and conditions as may be determined upon by the Commission.

Section 2. The Commission may sell said tract or tracts or any portions thereof, with or without buildings thereon, for cash, or upon such installments, terms, and contracts, and subject to such restrictions and conditions, as may be determined upon by the Homestead Commission; but no tract of land shall be sold for less than its cost, including the cost of any buildings thereon. All proceeds from the sale of land and buildings or other source shall be paid into the treasury of the Commonwealth.

Section 3. The Homestead Commission is hereby authorized to expend not to exceed one hundred thousand dollars for the purpose of this act.

Section 4. This act shall take effect upon its passage.

The principal considerations actuating the Commission to an experiment in housing were stated in their fourth annual report as follows:

"There are not enough wholesome low-cost dwellings.

"There is no prospect that present methods will ever supply enough unless the state encourages their construction.

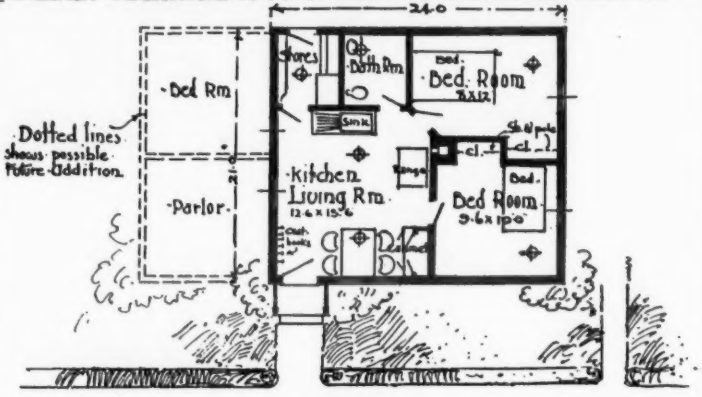
"Therefore the state should experiment to learn whether it is possible to build wholesome dwellings within the means of low-paid workers."

The Commission contemplated three kinds of housing development—the urban, suburban, and rural. For the first type, houses were to be detached or semi-detached, with about 5,000 square feet of land each, and were to be within easy walking distance of the mill or other place of employment.

The second type houses were to be detached, each house occupying a lot varying from ⅛ to ½ an acre, and the tract of land to be within a 5-cent car-ride of the mills.

The third type were to be farm cottages, on lots varying from ½ acre to 5 acres.

The first experiment was with Type 1. The Commission found abundant unoccupied land in the cities visited—Boston, Lawrence, New Bedford, Fall River, Lowell, and

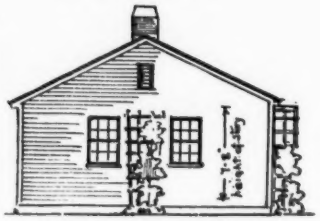


PLAN
Scale ⅛ in = 1-0

THREE ROOM BUNGALOW

DATA
Cost of House $1400
Area of House 504 ft

MATERIALS
Outside walls Cedar Shingle
Roof Green Slate asphalt
Inside Plaster Hollow Tile

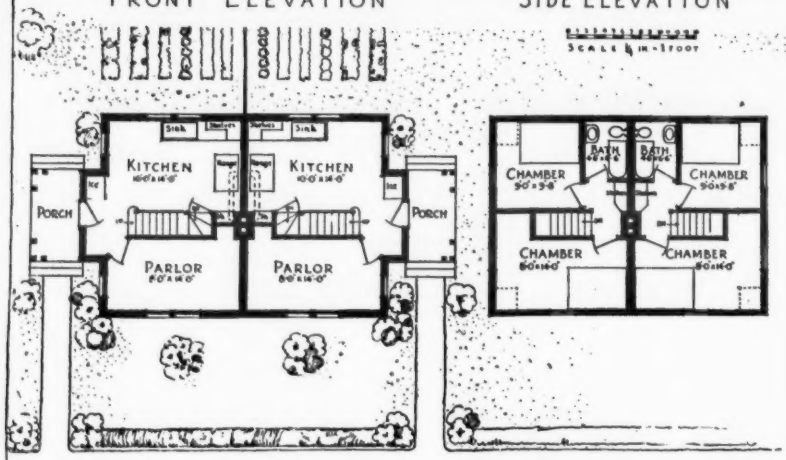


END ELEVATION

HOUSES AT LOWELL MASS FOR THE HOMESTEAD COMMISSION
ARCHITECTS KILHAM & HOPKINS BOSTON

FRONT ELEVATION

SIDE ELEVATION



FIRST FLOOR PLAN

SECOND FLOOR PLAN

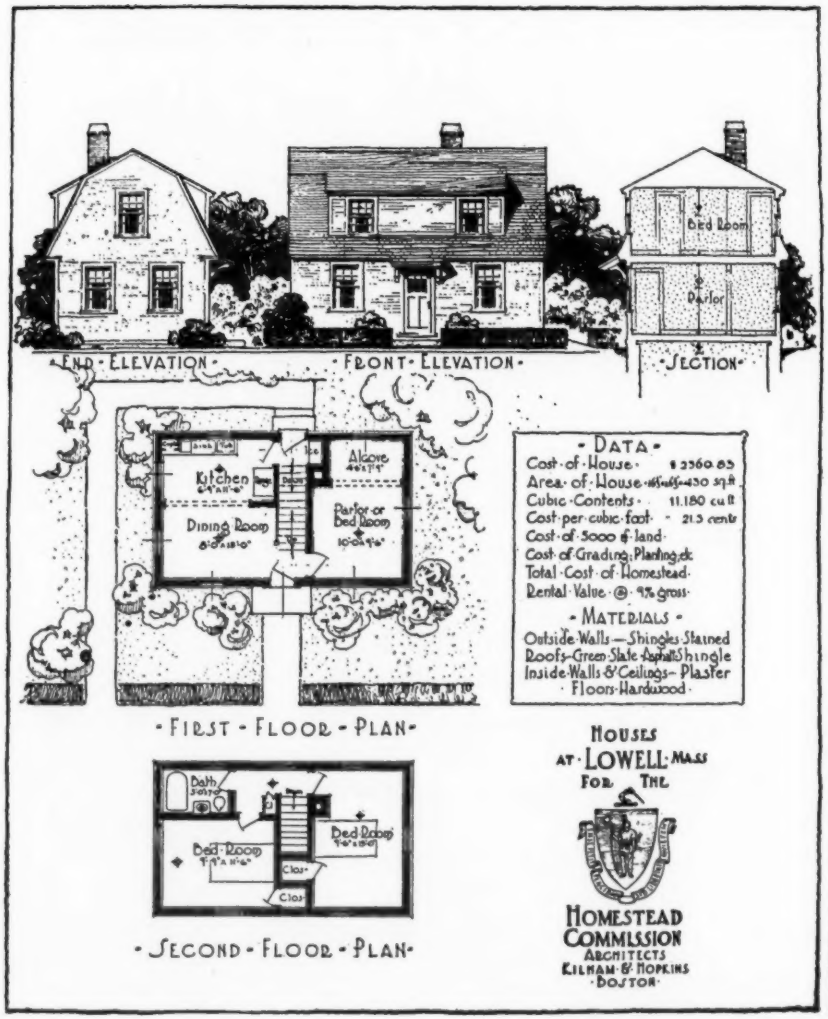
TWO FAMILY HOUSE FOR MILLWORKERS

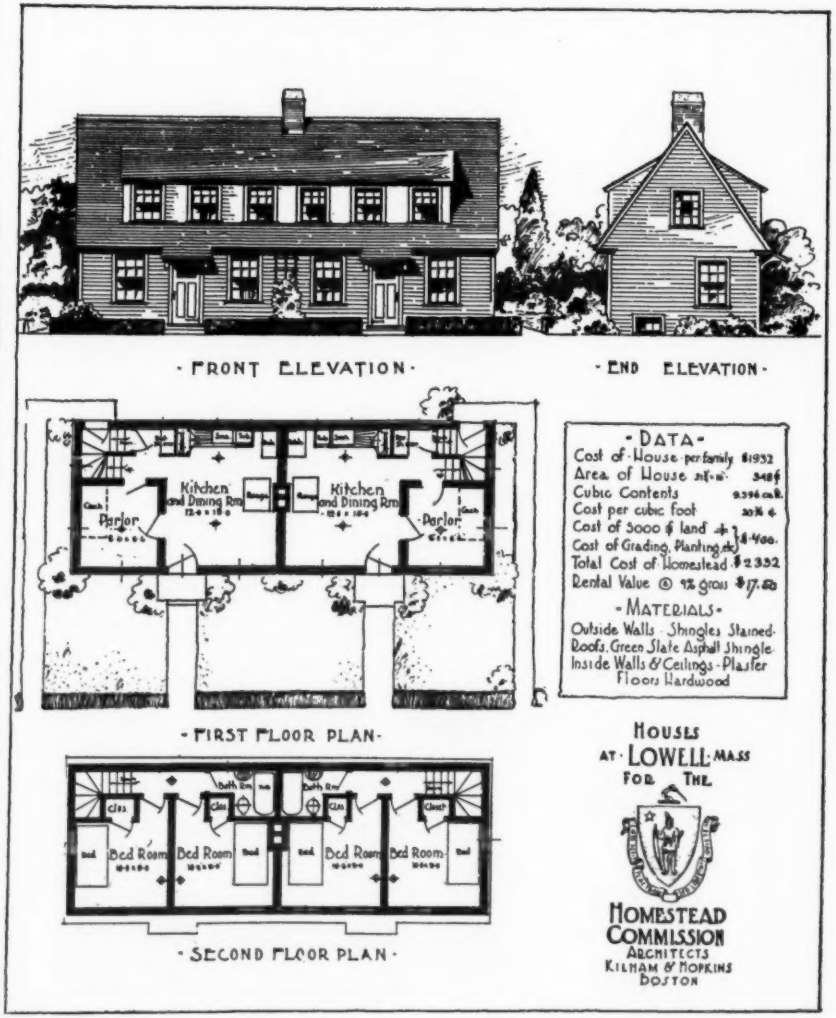
KILHAM & HOPKINS ARCHITECTS
9 PARK STREET BOSTON MASS.

DATA
Cost of House $1,870.94 Area of House 15×22-330f
Cubic contents 8910 cu ft Cost per cu ft 20.9¢

MATERIALS
Outside walls - Shingles stained
Roof - Green Slate - Asphalt shingles
Inside walls & ceilings - Plaster
Floors - Hardwood - Electric lights

HOUSES BUILT BY THE MASSACHUSETTS HOMESTEAD COMMISSION





HOUSES BUILT BY THE MASSACHUSETTS HOMESTEAD COMMISSION

others, at prices ranging from $45 to $400 or more per acre. The tract of land finally chosen was in the heart of Lowell, a city of low-paid operatives. In working out plans for houses, the minimum accommodation advisable was believed to be as follows:

Living-room, kitchen, three bedrooms, closets, cellar.

Cooking, heating, lighting, washing, toilet, and bathing facilities.

Provision for drainage, sewage- and garbage-disposal.

There need not be a heating system, but provision should be made for stoves, other than cooking-range, in places needed, and construction may well allow for a future heating system. The structure should be made as fire-resisting as possible with due consideration for cost. In order to bring the cost to the extreme low limit, it was deemed feasible to combine living-room and kitchen, and provide a parlor on the first floor suitable for use as the third bedroom if the family was large.

The sizes of rooms appear to correspond with the standard sizes recommended by housing authorities, with the exception of the height. Here 7 feet 6 inches has been fixed for the first story, and 7 feet 4 inches for the second. It is very difficult to establish a standard of height by rules of logic, and so the architects have followed custom and allowed themselves to be guided by a sense of proportion. Small rooms appear more commodious if they are low-studded, and the relation of height to lateral dimensions is pleasanter. The number of stairs to be climbed is less, and there is a substantial saving in the cost of the house. Add to this the desirability of low lines on the exterior, and the absence of any particular disadvantage to offset these many advantages, and the change from housing standards seems justified.

The equipment provided included a kitchen-cabinet, sink and drain-board with shelves under, set tub, drain for refrigerator, bathroom with three fixtures, hot and cold water piped to sink and tub, bathtub and bowl, thimbles in the chimney for kitchen range and additional stoves, a register in the kitchen ceiling opening into the bathroom floor, and closet-space for each bedroom.

Provision for hanging clothes in the bedrooms can be made by means of a closet or by a recess. The latter offers the same amount of space, but is not enclosed, and so is not likely to become a catchall. If the housekeeper is neat, she can put up a curtain across the opening. If she is untidy, the clothes will at least be subjected to the cleansing influence of light and air.

In addition to the above equipment, the houses are all piped for a gas-range in the kitchen, and are provided with electric lights throughout. Each house has a cellar the full area of the house, with carefully pointed walls and cement floor. Where possible, the back door opens upon the landing of the cellar stairs, so that the cellar can be easily and directly entered from the garden.

When minimum-sized houses are sold to operatives, it is not treating the owner generously to make these houses difficult of alteration. They should be so designed as to permit additions to be made easily and without ruining the appearance of the house. From this point of view wood has advantages over masonry.

The Commission is experimenting with bungalows in which, by a simple mechanical device, it is an easy matter to raise the roof and add a second story, or to detach an end wall and extend the house laterally.

The cost of these houses represents actual wartime conditions. The first houses were started in October, 1917, and other bids have been taken during January and February, 1918. The bids used were not exceptionally below the others; in fact, bids from two or three contractors were received which could have been utilized without injuring the financial projects of the undertaking, and the present contractor has expressed a willingness to build further houses at the same cost, showing that the undertaking has not been a losing venture on his part.

The method of sale proposed provides for a first payment of probably about 10 per cent, followed by successive monthly payments which will be the equivalent of interest plus a small amount on account of capital. By this plan the house is entirely paid for within a number of years, varying with the ability of the purchaser, but in no case more than twenty-eight years.

Massachusetts, with its admirable system of coöperative banks, provides an easy method for immediate ownership by the home-seeker. Deeds will be passed when payments amount to 20 per cent of the sale value. The Commission proposes to sell the property subject to certain restrictions. Under ordinary process of law, such property would fall within the scope of city laws and regulations as soon as sold by the state. It would then be part and parcel of the city and might, perhaps, be handled in such a way as to sacrifice some of the benefits intended by the state. On the other hand, a series of restrictions in addition may deter the would-be purchaser. Such a list, drawn up in legal terms, would very likely deter the ordinary man and would require careful explanation.

Another way of securing better neighborhood conditions in new housing developments is to provide a neighborhood center, or common building, where matters involving general neighborhood interest can be discussed, and where good fellowship can find a comfortable atmosphere in which to grow.

The Commission plans to follow the growth of its "colony," to assist in preparing the gardens, in matters of canning, cooking, and housekeeping, so that those who live in the new houses may be helped to a better mode of living and may act as disciples in spreading their ideas among others.

This spirit of common responsibility for the community welfare and of neighborhood goodfellowship may provide a better means of safeguarding the homes against bad conditions than a category of legal restrictions. Where a positive impulse is aroused, instead of a prohibition imposed, better results may be expected.

In the Homestead Commission's project there is no trace of paternalism or of charity. The act under which it is operating prohibits the sale of homesteads at less than cost. The object of the Commission has not been to supply the houses needed for the citizens of the Commonwealth, but to show that good houses can be supplied, and supplied within reach of the wage-earner. The Commission has hoped that when the results of its experiment were seen, private capital would be reassured and would enter the field of low-cost housing development.

WALTER H. KILHAM.

*The Need of Town-Planning Legislation and Procedure for Control of Land as a Factor in House-Building Development. II

By THOMAS ADAMS
Town-Planning Advisor, Commission of Conservation of Canada

IT IS obvious that the adoption of the most perfect system of planning and development of land will not do more than provide the right foundation on which to build up a solution by a slow and gradual process. In the degree in which that foundation is well laid, the ultimate social structure will be the more stable, and will be the more capable of adjustment to suit altered conditions from time to time as development proceeds; while, obversely, in the degree in which the foundation is badly laid the structure will be proportionately weak, and it will become the more difficult to go back to the beginning and remedy fundamental defects. Success can be attained only by using skill and exercising patience and vigilance in dealing with the problem in a scientific way. Attempts to reach a solution by short cuts and quick results, as in the past, can end only in failure.

General Considerations Involved

As a means of finding and applying the needed remedies, it seems necessary that several lines of activity should be pursued simultaneously. These include:

(*a*) The improving of national, state and local government organization in connection with all matters relating to land development.

(*b*) The making of a comprehensive investigation and survey of present conditions, and the preparing of detailed topographical maps and reports on rural conditions.

(*c*) The adopting of some system of planning all land for purposes of health, convenience and economic use, and the securing of adequate planning and development legislation and its effective administration by the governing authorities.

(*d*) The creating of agricultural and industrial settlements, free of artificial pressure and on sound economic lines.

(*e*) The formulating of a definite policy in regard to readjustment of social and industrial conditions after the war, particularly in relation to the problem of returned soldiers.

General recommendations in regard to each of these matters are set out below.

Government Organization

The Federal and state government legislation and machinery for dealing with the control of the planning, settlement and development of land, should be extended and improved.

There should be closer coöperation than hitherto between Federal, state and municipal governments, and between different branches of the public service, in regard to all matters dealing with land.

*Continued from the last issue.

The surveying branches of the governments should be strengthened and more comprehensive surveying work assigned to them.

A complete and coördinated system of Federal, state and municipal administration of land resources should be devised, with the whole organization centralized in a department or permanent commission of the Federal Government.

The operations of venders of real estate should be regulated, so as to prevent misrepresentation and other immoral practices in connection with the sale of land, and all real-estate operators should be licensed by governments under safeguards designed to prevent improper dealing in land.

State governments should consider their systems of administering highways, municipal affairs and public health, with special regard to the need of securing more coöperation and efficiency in connection with land and municipal development than is possible under present conditions, and for increasing the responsibilities and powers of municipal authorities, under the advice of a skilled department of local government in each state.

To meet a temporary need, the Federal Government should take an active interest in the housing of workers engaged in munition plants, particularly in government arsenals and in small towns and rural districts where there is lack of strong local government. The Federal Government should either require adequate accommodation and proper sanitary conditions to be provided at a reasonable cost for those who are engaged in the service of the country, or itself assist in making that provision, as is being done in Great Britain and allied countries.

Whether in regard to peace or war conditions, the main objects of any improvement in government organization, of rural and of urban conditions, must be to conserve life and to stimulate production. To achieve these objects it is essential, above all other things, that greater activity be shown by governments in protecting public health, in promoting sound systems of education, and in controlling land speculation.

The Cost of Neglect

We have the estimate from United States sources that feeble-minded children cost the United States Government $90,000,000, and that crime costs $600,000,000 a year. The feeble-minded child produces the strongest link that connects neglect of social and health conditions with crime.

While these figures are of value in conveying some impression of the importance of the problem of public health, they are, of course, of no value as an indication of the extent of the government responsibility, since the factors necessary to show the proportion of the loss due

to individual neglect and the proportion of maladministration must continue to be unknown. Nor are they any guide as to the respective losses caused by overcrowding in cities on the one hand, and by isolation and poverty in rural districts on the other hand. But enough is known to make it clear to every student of social conditions that a large share of the responsibility for the deplorable and unnecessary loss of life and physical deterioration on this continent rests with the various governing authorities, who have the powers to regulate land development, and that there are conditions in the rural districts as injurious to health and morals as in the crowded city slums.

Looking Ahead

At present, there is a "confusion of tongues" as to the desirability, or otherwise, of money and human energy being spent on works that are not absolutely essential to the prosecution of the war. The weight of evidence seems to be in favor of everything being suspended which can be put off without injury to our social and economic life. As conservation of health lies at the root of our social life, and as it is one of the most essential needs as a means of prosecuting the war itself, as well as to make up for the wastage of war and to utilize our natural resources, public health expenditures should be the last to be curtailed. Moreover, whatever public works may be delayed, there should be no delay in thinking out and formulating a policy for future action, having regard to past failure and to the lessons taught by the war.

Apart from the question of general education, there is need for improvement in the training of those engaged in municipal and sanitary engineering, land surveying, and assessment valuation, in order to qualify a larger body of professional men to specialize in the work of planning and developing land, controlling public health and assessing property values. The organization of municipal and sanitary engineers for purposes of specialized professional training and for the advancement of their particular branch of engineering is needed.

In our universities, too, we want to see an awakening to a more vital interest in civic problems and in the science of land development and industrial organization. Professor Geddes claims that the universities in all the countries in the passing generation have been strongholds of Germanic thought, with its mechanical and venal philosophy. "The reawakening movements of the universities have been slow, timid, blindfold, because lacking in civic vision."

The Land Problem

Enough, but not too much, has been said on the subject of land speculation. The governments have a special obligation, as the original venders of land, and in view of the far-reaching effects of immoral practices in connection with its sale, to employ special means to protect purchasers from such practices. There are numerous obvious steps which should be taken in this respect, including the registration of those engaged in real-estate operations and the application of adequate safeguards to protect purchasers.

Government control of land development and the system of assessing and taxing of land should have regard to its use, its non-use, and its abuse as an instrument of production. The economic use of land must be encouraged, the non-use of land hindered, and the abuse of land prevented, by government policies; unless we intend to continue to sacrifice the surplus fruits of production—the only source from which increase of real wealth is derived—for the plaything of speculation.

A Comprehensive Survey

A comprehensive survey of the social, physical and industrial conditions of all rural territory should be made, with the object of ascertaining: first, the main facts regarding the problems of rural life and rural development in territory already settled and organized; and, second, more precise information than is now available regarding natural resources in unorganized territory.

The survey should be so prepared as to enable constructive proposals to be formulated regarding the economic development of the natural and industrial resources of the country, and regarding the location of new towns, railways and highways.

It should include a complete inventory and an additonal survey of all lands which have been already surveyed and homesteaded with a view to securing their settlement under proper conditions and to devising means to lessen injurious speculation.

It should deal with questions of taxation and assessment of land and buildings for state and local purposes.

Agricultural and Industrial Settlements

New town settlements (garden cities) should be established where there are good facilities for profitable production and distribution, where manufacturing and intensive farming can be successfully carried on, and where advantage can be taken of the tendency to remove industries from crowded centers of rural districts or to establish new industries near waterpowers and raw materials.

Government capital, or the guarantee of bonds, should be made available for these settlements and should be made repayable at a fixed rate; the benefit of all profits derived in excess of that rate should be spent on improving the settlements.

The increment of land values created by the conversion of cheap agricultural land into a valuable town-site gives to the garden-city class of development a special financial stability, which is not possessed by the agricultural settlement.

Coöperation should be stimulated and encouraged by government action, and the facilities for coöperation should be provided by skilled planning; but this should be done without imposing undue restraint on personal initiative or freedom. Coöperative effort should be organized individual effort. In a coöperative scheme, artifical control should be limited to the prevention of wrongdoing, including the prevention of such forms of land development as are economically and socially injurious.

The recommendation that industrial, or partly industrial and partly agricultural, town settlements be established is apt to be regarded with suspicion by practical men because of its novelty. That novelty has now worn off in England, and garden cities and suburbs are no longer looked upon as visionary schemes.

The movement in England has attracted widespread

attention in all European countries and in the United States and has caused influential bodies to advocate the establishment of similar communities in these countries.

Studying the Problem in the United States

The following resolution (Senate Resolution 305) was passed by the United States Senate in the early part of this year, and the inquiry instituted as a result is still proceeding:

"*Whereas*, the garden-city and garden-suburb movement in Europe has made wonderful progress during the first eight years of its existence; and

"*Whereas*, the object of this movement is to secure permanent and comfortable homes for the people on terms within the reach of the average income, and to combine the advantages of town and country in the same community; and

"*Whereas*, this movement is contributing materially to the health, comfort, and prosperity of the people who have experienced its benefits, and

"*Whereas*, the movement, in the estimation of many, points the way to the long-sought goal of a contented, home-owning population; and

"*Whereas*, a beginning along this line is claimed to have been made in the United States, and

"*Whereas*, thousands of American citizens have petitioned members of Congress for an investigation of the movement both in Europe and the United States; therefore be it

"*Resolved*, that the Senate Committee on Agriculture and Forestry be authorized and requested to hear and consider such testimony as may be produced before said committee in Washington regarding this movement, both in Europe, in the United States and elsewhere, and to report its findings to the Senate."

It is significant that this resolution was referred for consideration to the Committee on Agriculture and Forestry, indicating that it is the rural rather than the urban aspect of the movement which is being first investigated.

One of the main objects in carrying out the suggestion to create combined agricultural and industrial settlements would be to provide opportunities for the employment of returned soldiers in varied kinds of productive enterprises in both rural and urban areas.

These settlements would also be invaluable as a practical demonstration of town building and land development. Social progress in England during the last fifteen years has been greatly influenced as a result of the one experiment in industrial development and housing which has been carried out in Letchworth.

Before initiating any comprehensive policy to establish new centers of population, it might, however, be more prudent to begin by developing one new manufacturing and agricultural town, where systems of rural and urban land development could be tried out, where opportunities for varied kinds of employment could be provided, where the strength and weakness of different methods could be tested, and where there could be evolved, by a process of practical experience, the soundest economic principles on which development should be guided in the future.

Some Final Observations

False economic standards have been largely responsible for bad beginnings in land settlements, wasteful speculation, and unhealthy and haphazard developments of land that stand self-condemned as part of our social system. Some men have sought to excuse these evils on the ground that they are the outcome of natural laws, whereas they are largely caused by the refusal to recognize the demands of nature and to apply intelligent direction to what is purely artificial growth.

But probably, on the whole, there is now comparatively little disagreement as to the need for investigation and reform of our rural conditions, the only doubt still prevalent being as to whether the need is great enough to cause disturbance of our minds during the war. On that point there appears to be no doubt in allied countries, in every one of which new principles of land development are being studied and applied. Even in France, where one would think that the urgency of proceeding with the work of reconstruction of devastated areas would prevent careful preparation of plans of development, time is being given to think out and prepare schemes of regional planning with special regard to health and the teachings of modern science.

Already, a law has been passed requiring every town and village in that country, whether within the war zones or not, to lay out its future developments according to the principles of modern city planning. To enforce this, there will be a federal commission, with a general commission in each of the departments, and, under these general commissions, community commissions to direct local work. This may seem somewhat remote as an object lesson to America, which, happily, has no areas devastated by the war; but, as a matter of fact, the creative work that has been done in America requires the application of the same principles as are required in connection with the recreative work that is now forced upon the people of France, only we have in America the sort of advantage of starting from the beginning. But the chief lesson we may derive from the example of France in this matter is that, although that country is more directly affected than ours by the war, its rulers are not showing indifference to the work of social and economic reconstruction, on the ground that their whole activities should be concentrated on war operations. Indeed, they recognize that the very sacrifices which are being made in the war demand, in the interests of continued national stability, that they prepare plans of development which will ensure healthy living conditions and increased efficiency in production in the future. In the degree in which our undeveloped resources in America are greater than in France, and to the extent that our hands are at present more free to deal with any necessary readjustment of our conditions, we have, in that degree and to that extent, the greater responsibility to apply ourselves, unhesitatingly and at once, to the work of planning for the future, or organizing and coördinating our government machinery and of ascertaining the facts regarding our social and industrial conditions in town and country.

We need not ignore the lessons of other countries, but our first duty is to acquire a thorough knowledge of our own conditions and to formulate and strive for the attainment of our own ideals, in our own way, and with the realization of our power to shape our own future.

Military and Social Need of Better Wartime Housing*

By CHARLES MULFORD ROBINSON

IT HAS been well said that the war cannot be won by the men at the front alone. Behind the fighters there is required a vast organization, supporting and supplying them. Men, munitions, hospital supplies, food, comfort, and even cheer must be kept moving forward in ceaseless streams from the great reservoir at home. That the reservoir may be equal to these demands upon it, challenges the nation's patriotism and forethought. To this end, the Administration has commandeered, and has had ready response from, the best intelligence of the country.

The statement of all this may seem trite enough. But its significance will quickly become apparent if one traces the far-reaching influence of "the house that Jack built" for the worker in the munitions plant.

This, then, is the house that Jack built—a thing of shreds and patches, of sheet-tin and packing-boxes, of foul air, because unsanitary and overcrowded—part of a vast field of flotsam in a sea of mud. These are the people who live in the house that Jack built; wan, listless, sickly men; disheveled women; dying children. And this is the stream of munitions, made by people who live in the house that Jack built: slow, weak, uncertain. The splendid courage of the fighting men, the high patriotism which supplies millions of dollars to pay for the munitions, the inventive genius which devised them, the executive ability that planned the output, arranged the transportation, gathered the raw material, all this finds its efficiency reduced because no thought was given to the houses in which the workers dwell. Out of the little human tragedies, slowly enacted in scores of thousands of those houses, looms a national tragedy, and out of that a world catastrophe. The world may not be made safe for democracy, if democracy's individual homes, raised in haste to meet war needs, be not made reasonably safe for habitation. England, France, and even Germany, early learned this lesson which today the United States is facing.

It is not a very difficult or complex problem. The Government knows in exactly what places a demand for war munitions requires a sudden concentration of industrial workers. It knows now, not merely from the experience of the other warring countries but from local observation, that the need for a skillful planning of the cantonments, designed for the more or less temporary housing of men going out to war, was not really greater than is the need for the proper housing of the men who are manufacturing the war material. In fact, the latter need offers a problem of particular appeal, since it involves the shelter not alone of men who are being toughened for war, but also of frail women and of little children. And the men themselves in these communities are not the most physically fit. In increasing degree they are made up of those whom the military authorities rejected.

There is, further, the need that the homes of all these people—men, women, and children—shall afford them some moral as well as physical protection. Not that these people are worse than others, or have less power for resisting evil, but that their temptations are greater. The grave moral dangers of bad housing, through its overcrowding and its lack of privacy, are well known; but aside from that danger, the hours of these workers are long, and theirs is the grinding monotonous task, without the inspiration, the sustaining enthusiasm, the romance, that goes with the great adventure of war. There has been, on the other hand, no closing in their behalf by Government request of redlight districts; no vast Y. M. C. A. "huts" have been erected for them and provided with brilliant speakers and trained workers. Almost all the available recreation facilities in the munition towns have been commercialized and are of low type. Yet when the home is wretched, the street beckons. It means much to the Government that these men and women be kept as strong and contented as may be—poor homes are ever fertile ground for strike agitators. It means much to the individuals themselves and to their children. It means much also to the towns and cities where they have been assembled.

Yet it is clear that the provision of good homes, on an adequate scale, cannot be safely left to the communities so suddenly flooded. The invasion has brought a multitude of strictly municipal problems which demand solution. There are schools to be built, for example, streets extended, sanitation to be provided, policing and fire-protection to be afforded. Neither, on the other hand, can the private enterprise and private capital in the towns be wholly depended on to provide the needed housing, for there are great factories to be built and equipped or enlarged, with promise of better financial returns than housing offers. Still, it is known that, with initiative, and capital provided at reasonable cost, housing operations undertaken on a large scale, and in accordance with sound principles, can be made to give the desired results in sanitation, comfort, and happiness at no prohibitive cost—may even be made to pay their own way in so far as they serve the highly paid munition workers.

Perhaps this economic phase of the question is too readily overlooked. It is easy in thinking of the need, and then in picturing to one's self attractive industrial communities of pretty homes on pretty streets, to forget the economy with which those results can be obtained. When you think of it, however, the street which charms because it gently undulates, in adhering to a slightly irregular topography, or because, in lack of breadth, it is in scale with the little homes that border it, or perhaps, finally, because it has not the rigidity of absolute straightness, since it circles around a hill or other obstruction instead of expensively surmounting it—that street is likely to be actually cheaper to construct than is the broad and ugly

*EDITOR'S NOTE.—This article was written shortly before the death of Charles Mulford Robinson, and, due to the pressure on our pages of housing material, has been held until the present time. We have thought it best not to edit this article in any way, even though governmental action has now taken place while it was only being worked for when Mr. Robinson added his plea to those of the many others which were laid before the Administration. Perhaps it is especially fitting that these last words of his should be in support of a great national need and filled with the spirit with which he approached his problems.

street with its heavy cuts and fills and its needlessly wide roadway. It is cheaper also to maintain. Its house lots are not more attractive merely, but are less expensive to build upon. The adaptation of their length to the needs of the people who live on them further reduces their cost. The houses, themselves, built in large number, with somewhat standardized materials and from a few plans, are not so costly as their good looks and sanitation might suggest. In short, the thought of well-planned industrial communities, where the efficiency of munition workers is greatly increased because they are well and strong and happy, is wholly practical.

Again, whether the need to be met is a reasonably permanent one, or only temporary, must affect the Government policy in any particular case. But all these questions, and the kind of houses to be erected, and the terms on which they should be sold or rented are to be considered as really incidental matters. They should not be allowed to befog the one great issue of providing decent and sanitary living quarters for those workers without whom soldiers and sailors are impotent. "More even than your men," say the Allies, "we want from you ships, guns, and munitions." To supply that need, the United States must have homes as well as factories.

Institute Business

MEETING OF THE BOARD OF DIRECTORS HELD ON JANUARY 17, 18 AND 19, 1918, AT THE OCTAGON, WASHINGTON, D. C.

The meeting was called to order by President Mauran. Others present were First Vice-President La Farge, Second Vice-President Willcox, Secretary Parker, Treasurer Waid; Directors Coolidge, Jensen, Lubschez, Sellers, Faville, Fenner, Kimball, and the Executive Secretary.

The President read a telegram from Edwin H. Brown, stating that his Red Cross duties in New Mexico would prevent his attendance; also a telegram from Mr. Favrot to the effect that he could not be present.

Repairs to The Octagon Stables

The Secretary presented a report from the Building Committee, Wm. M. Kendall, Chairman, under date of January 4, 1918, to the effect that, through the liberality of President Mauran, Mr. Fenner, and Mr. Pope in contributing a fund of $1,500, the structural brickwork, the woodwork, and roof of the stable are now in substantial condition. It was found that the restoration of the roof to its original flat form was more economical than the retention of the sloping one. The funds did not permit of further work on the exterior, such as restoration of the doors and windows. These have been boarded up temporarily. The report also referred to a careful examination of the Octagon grounds made by the Chairman, Mr. Pope, and Glenn Brown in November with a view to their restoration.

Gift of Proceedings to the Institute

The Treasurer read a letter of December 28 from Pierre LeBrun of the New York Chapter, in which he offered to the Institute a complete set of Proceedings, and to bind and send them to the Octagon if they should be accepted.

The Treasurer also read his letter of December 29 thanking Mr. LeBrun for this generous gift.

It was resolved that an expression of appreciation from the Board be sent to Mr. LeBrun by the Treasurer, and that the books be accepted and placed in the permanent records at the Octagon.

Initiation Fee Remitted for 1918

It was resolved that the resolution of 1917 remitting the initiation fee of those applicants for Institute membership who were Chapter members prior to December 6 1916, be continued during 1918.

Rental of 521 18th Street

The Office of Naval Intelligence in the Navy Department has been lent, without compensation and as a matter of courtesy, the drawing-room at the Octagon for conference purposes; and has been rented the house at 521 18th Street on a yearly basis, beginning November 22, 1917. Under a written agreement with the Navy Department, the property is to be thoroughly repaired and kept in good condition without cost to the Institute, and the improvements will remain on the property without cost to the Institute at the end of the term.

Remission of Dues

The Treasurer reported that, in accordance with the resolution of the September Board meeting, notices were sent to all Institute members concerning the remission of dues for those engaged in active service in the Navy, Marine Corps, Aviation Corps, Red Cross, and related branches.

Return cards received and information direct from Chapter secretaries indicate that there are eighty-two men in active service. The Treasurer submitted a complete list of these, showing the name, chapter, and service in which engaged, also a second list of doubtful cases. It was resolved that the dues of all on the first list be remitted for the year 1918; and remission of the dues of those on the second list was left in the hands of the Treasurer for decision after investigation.

Remission of Dues for Members Engaged in Teaching Architecture

The Secretary presented a report of August 31, 1917, from Prof. W. P. Laird, Chairman of the Advisory Committee to the Committee on Education, concerning the suggestion that the Institute consider some plan for remitting the dues of its members who are engaged in teaching in the schools of architecture.

The Advisory Committee was of the unanimous opinion that no distinction in the matter of dues should be estab-

lished between members engaged in teaching and others. In taking this position the Committee recognized the smallness of the teacher's income, but believed this to be largely compensated for by the regularity with which it was paid. It was also of the opinion that the benefits received by the teaching profession from membership in the Institute are not less than those to the profession generally, and that in the broadest sense of the word the Institute is equally indispensable to both of them. It was therefore of the opinion that no real difference existed as to the benefits received by the two groups and that there should be no difference in their obligations.

The report was accepted.

Excess Income Tax on Professional Men

The President reported a letter of December 7 from Mr. George Gibbs, President of the American Institute of Consulting Engineers, making inquiry as to what action had been taken by the American Institute of Architects with regard to the provision in the new income tax law as set forth in Section 209 with respect to excess income taxes against professional men.

Mr. Gibbs was advised that the Institute has taken no formal action, but was willing to confer in any preliminary way. For the purpose of such a conference Messrs. La Farge, Gilbert, and Waid were designated as a subcommittee in New York if further coöperation should be desired.

New Members Elected to the Institute

Aldrich, Will S., St. Joseph, Mo.
Bassett, David B., Philadelphia, Pa.
Berger, Carl P., Philadelphia, Pa.
Bernet, Harre M., Dallas, Tex.
Bradford, Joseph Nelson, Columbus, Ohio.
Cavin, William B., Philadelphia, Pa.
Doane, Ralph Harrington, Manila, P. I.
Eckel, George R., St. Joseph, Mo.
Edmunds, Franklin D., Philadelphia, Pa.
Erskine, Richard, Philadelphia, Pa.
Field, Gerald Castle, Seattle, Wash.
Groben, William E., Philadelphia, Pa.
Hawley, Samuel D., Philadelphia, Pa.
Holland, Leicester Bodine, Philadelphia, Pa.
Keen, Charles Barton, Philadelphia, Pa.
Kimball, Fiske, Ann Arbor, Mich.
Lane, Roy E., Waco, Tex.
McIlvaine, John Gilbert, Philadelphia, Pa.
Morrison, Karl E., Erie, Pa.
Savery, Addison H., Philadelphia, Pa.
Simon, Edward P., Philadelphia, Pa.
Simon, Grant M., Philadelphia, Pa.
Stem, A. H., St. Paul, Minn.
Tatum, Harold, Philadelphia, Pa.
Williams, Owen J., West Palm Beach, Fla.
Wise, Herbert C., Philadelphia, Pa.
Wood, William Albert, Philadelphia, Pa.

NOTE.—At this meeting of the Board a great deal of time was spent in the discussion of the interim reports of committees. Had it not been for the delay and loss of manuscript in the mails, these would have appeared in the last issue. The nearness of the convention in April now makes it appear unnecessary to print those reports in view of the fact that final yearly reports will be made at the convention.—EDITOR.

Nominations for Officers

TO THE SECRETARY OF THE
AMERICAN INSTITUTE OF ARCHITECTS,
Washington, D. C.

At the coming Convention of the Institute the question of a proposed amendment to the By-Laws, involving the continuation in office of the present administration, is to be settled.

In the event that the wish of the Institute, as expressed through its delegates, is not to amend the By-Laws, we believe that a complete list of nominations for officers should be before the Convention, and we therefore place in nomination the names of the following members to fill all offices.

This petition is submitted in accordance with Article IX, Section 2, of the By-Laws, and will be in your hands not less than thirty days prior to the Convention at which the election is to take place.

For President:
Thomas R. Kimball, of Omaha
For First Vice-President:
Elmer C. Jensen, of Chicago.
For Second Vice-President:
Wm. Stanley Parker, of Boston.
For Secretary:
Wm. H. Schuchardt, of Milwaukee.
For Treasurer:
Edgar V. Seeler, of Philadelphia.
For the Board of Directors:
(Four are nominated, as in the event of the election of Mr. Kimball to the Presidency, the nominee receiving the smallest number of votes would be elected to fill his unexpired term on the Board.)
Edward W. Donn, of Washington.
Robert D. Kohn, of New York.
S. S. Labouisse, of New Orleans.
Ellis F. Lawrence, of Portland, Ohio.

Signed by:

John Irwin Bright
E. P. Bissell
F. L. Ackermann
H. Van Buren Magonigle
F. Livingston Pell
D. Knickerbacker Boyd
Wm. D. Hewitt
C. L. Borie, Jr.
E. E. Fetterolf

Nomination for Election of Edward W. Donn, to the Board of Directors, A. I. A.

Washington Chapter—Unanimous Vote; San Francisco Chapter—William B. Faville, Chas. Peter Weeks, August G. Headman, Smith O'Brien, Morris M. Bruce, John Bakewell, Jr., Sylvain Schnaittacher; Philadelphia Chapter—Edward A. Crane, George I. Lovatt, Thomas M. Kellogg, John P. B. Sinkler, Edwin H. Fetterolf; South Carolina Chapter—N. Gaillard Walker, Edwin D. Sompayrac, Pres., Charles C. Wilson, George E. Lafaye, H. Olin Jones; Southern Pennsylvania Chapter—M. I. Kast, Thomas H. Hamilton, Edward Leber, Reinhardt Dempwolf, J. A. Dempwolf, W. B. Billmeyer, John B. Hamme, B. F. Willis, George F. Gemmill; Toledo Chapter—Lawrence S. Bellman, Edwin M. Gee, Charles M. Nordhoff, Harry W. Wachter, Bernhard Becker, George S. Mills, Thomas F. Huber; Michigan Chapter—William B. Stratton, D. J. von Schneider, Adolph Eisen, Richard Mildner, James B. Nettleton, H. J. M. Grylls, Charles Kottings, Marcus R. Burrowes, Emil Lorch, Arthur H. Scott; Iowa Chapter—Eugene H. Taylor.

The Copyright on the Uniform Contract Upheld by the Court

Various infringements of the Uniform Contract having been brought to the attention of the Institute, the infringers were duly warned to desist from the practice, which had been generally resorted to under the impression that the Institute had abandoned the Uniform Contract when it published the new Standard Documents. Abraham Kasman, doing business as the Excelsior Stationery Company, in New York City, declined to recognize the Institute's rights, and suit was brought against him. The decree of the Court was a complete victory for the Institute; together with the injunction, it is here printed:

UNITED STATES DISTRICT COURT,
SOUTHERN DISTRICT OF NEW YORK.

THE AMERICAN INSTITUTE OF ARCHITECTS, Plaintiff,
vs.
ABRAHAM KASMAN, doing business under the name of EXCELSIOR STATIONERY COMPANY, Defendant.
In Equity, No. 14-291.

Decree

The bill in the above case having been filed and subpœna duly issued and served upon the defendant and an order taking the bill *pro confesso* having been entered on October 8, 1917, and it appearing that the defendant thereafter appeared and that an order was entered extending his time to answer but leaving the order to take a decree *pro confesso* in full force and effect until the filing of said answer, and it appearing that said defendant brought a motion to dismiss the bill, which motion was heard and denied, and an order having been entered on November 17, 1917, denying said motion and giving the defendant until November 26, 1917, to file his answer and leaving all previous orders in full force and effect, and it further appearing that no answer has been filed although such answer was due on or before November 26, 1917, and thirty days having passed since the entry of said order to take the bill *pro confesso*, it is thereupon adjudged and decreed as follows:—

First: That the copyright of the Uniform Contract set forth in the bill herein is good and valid.

Second: That the plaintiff is the sole and exclusive owner and proprietor of the copyrighted book entitled "The Uniform Contract" and attached to the bill of complaint herein as "Exhibit A," and that plaintiff has done all acts and complied with all legal requirements necessary to establish its right to the aforesaid copyright under the statutes of the United States in such case made and provided.

Third: That plaintiff has caused to be printed in the several copies of every edition of said book published by plaintiff or its licensee, on the title page of said book, the word "Copyright," together with the year the copyright was entered, and the words "American Institute of Architects."

Fourth: That the plaintiff is also the owner of the entire right to recover damages and profits from all infringements of said copyright of its book and that defendant herein has infringed upon said copyright by producing and selling uniform contracts like "Exhibit B" to the bill attached.

Fifth: That a perpetual injunction issue against the defendant, the said Abraham Kasman, restraining him, his clerks, agents, servants, and employees from publishing, selling or exposing for sale, or causing or being in any way concerned in the publishing, selling or exposing for sale of the said book hereinbefore complained of and forming "Exhibit B" attached to the bill of complaint herein, and from directly or indirectly infringing upon said copyright.

Sixth: That this cause be referred to William Parkin, Esq., as special Master, to take, state and report an account of plaintiff's damages and defendant's profits under and in accordance with this decree, and to make special findings as to whether defendant received actual notice of infringement and continued thereafter to infringe, and how many infringing copies defendant made, sold, and had in his possession after said notice of actual infringement and also to specially report what measure of damages may appear to be just in view of the circumstances in lieu of actual damages and profits, the final determination of the plaintiff's recovery being reserved until after the filing of his report.

Seventh: That the defendant deliver up, on oath, into custody of the Master hereinbefore appointed all the infringing copies or devices, as well as all plates, molds, matrices, or other means for making such infringing copies.

Eighth: That the plaintiff do recover of the defendant its costs and disbursements of this suit to be taxed.

Dated December 3, 1917. (Signed) MANTON,
U. S. D. J.

THE PRESIDENT OF THE UNITED STATES OF AMERICA,

TO

ABRAHAM KASMAN, his clerks, agents, servants and employees,

Greeting:

WHEREAS, it has been represented to us in our District Court of the United States for the Southern District of New York in a suit wherein The American Institute of Architects is plaintiff and you, the said Abraham Kasman, are defendant, that said plaintiff is the sole and exclusive proprietor of a copyrighted book "The Uniform Contract" as set forth in the bill of complaint herein; that the copyright of said book is good and valid; and that you, the said Abraham Kasman, defendant, have infringed upon said

copyright and upon the exclusive right of the plaintiff thereunder.

NOW, THEREFORE, we strictly command and enjoin you, the said Abraham Kasman, your clerks, agents, servants and employees, under the penalties that may fall upon you in case of disobedience, that you forthwith desist from publishing, selling or exposing for sale, or causing or being in any way concerned in the publishing or selling or exposing for sale of the book complained of and being "Exhibit B" attached to the bill of complaint in said suit and from directly or indirectly infringing upon said copyright.

Hereof fail not.

WITNESS the Honorable Learned Hand, United States District Judge for the Southern District of New York, at the City of New York, on the 5th day of December, in the year of our Lord nineteen hundred and seventeen.

[SEAL] (S) ALEX. GILCHRIST, JR., Clerk.

Subsequently a Final Decree was Entered as Follows:

UNITED STATES DISTRICT COURT,
SOUTHERN DISTRICT OF NEW YORK

THE AMERICAN INSTITUTE OF ARCHITECTS, Plaintiff,
vs.
ABRAHAM KASMAN, doing business under the name of EXCELSIOR STATIONERY COMPANY, Defendant.
} In Equity, No. 14-291.

Final Decree

WHEREAS, by decree entered herein December 3, 1917, it has been ORDERED, ADJUDGED, and DECREED as follows:

First: That the copyright of The Uniform Contract set forth in the bill herein is good and valid.

Second: That the plaintiff is the sole and exclusive owner and proprietor of the copyrighted book entitled "The Uniform Contract" and attached to the bill of complaint herein as "Exhibit A," and that plaintiff has done all acts and complied with all legal requirements necessary to establish its right to the aforesaid copyright under the statutes of the United States in such case made and provided.

Third: That plaintiff has caused to be printed in the several copies of every edition of said book published by plaintiff or its licensee, on the title page of said book, the word "Copyright," together with the year the copyright was entered, and the words "American Institute of Architects."

Fourth: That the plaintiff is also the owner of the entire right to recover damages and profits from all infringements of said copyright of its book and that defendant herein has infringed upon said copyright by producing and selling uniform contracts like "Exhibit B" to the bill attached.

Fifth: That a perpetual injunction issue against the defendant, the said Abraham Kasman, restraining him, his clerks, agents, servants and employees from publishing, selling or exposing for sale, or causing or being in any way concerned in the publishing, selling or exposing for sale of the said book hereinbefore complained herein, and from directly or indirectly infringing upon said copyright.

Sixth: That this cause be referred to William Parkin, Esq., as Special Master, to take, state, and report an account of plaintiff's damages and defendant's profits under and in accordance with this decree, and to make special findings as to whether defendant received actual notice of infringement and continued thereafter to infringe, and how many infringing copies defendant made, sold, and had in his possession after said notice of actual infringement, and also to specially report what measures of damages may appear to be just in view of the circumstances in lieu of actual damages and profits, the final determination of the plaintiff's recovery being reserved until after the filing of his report.

Seventh: That the defendant deliver up, on oath, into custody of the Master hereinbefore appointed all the infringing copies or devices, as well as all plates, molds, matrices, or other means for making such infringing copies.

Eighth: That the plaintiff do recover of the defendant its costs and disbursements of this suit to be taxed.

AND WHEREAS, this cause has been referred to William Parkin, Esq., as Special Master, to take, state, and report an account of plaintiff's damages and defendant's profits and what measures of damages may appear to be just in lieu of actual damages and profits, and

WHEREAS, hearing and examination of defendant, Abraham Kasman, has been had before said Special Master, and

WHEREAS, said Special Master has by report filed February 19, 1918, made an award of Seventeen hundred and forty Dollars ($1740) damages in lieu of damages and profits, and

WHEREAS, full settlement has been made by said defendant, Abraham Kasman, of said award and all damages and costs of this suit, and

WHEREAS, said defendant, Abraham Kasman, has delivered up into the custody of said Special Master all the infringing copies or devices, as well as all plates, molds, matrices, or other means for making such infringing copies.

NOW, THEREFORE, by consent of the parties hereto, it is ORDERED:

That the provisions of the First, Second, Third, Fourth and Fifth paragraphs of said decree shall be continued in full force and effect, and

That all the infringing copies or devices surrendered into the custody of the Special Master be delivered to plaintiff herein, and

That no further decree be entered herein.

Dated February 19, 1918.

[SEAL] JULIUS M. MAYER, U.S.D.J.

We hereby consent to the above decree.

[SEAL] EDWARDS, SAGER & RICHMOND,
Attorneys for Plaintiff.

[SEAL] NATHAN VIDAVER,
Attorney for Defendant.

Structural Service Department

D. KNICKERBACKER BOYD, *Associate Editor*

In connection with professional societies, organized bodies, and the following Committees of the Institute, working toward improvements in building materials and methods, and higher ideals in the sheltering of humanity:

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*(Each Chapter has a corresponding member who is chairman of the Chapter Subcommittee.)

CONTENTS

STONE, SLATE, BRICK, HOLLOW TILE, TERRA COTTA

SERIAL NO. 3, MARCH, 1918

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Granite 3C
Marble 3D
Sandstone 3E
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Building-Stones in General—Exterior and Interior. 3A

Governmental Activities and Statistical Data. 3A1

(*a*) An agreement was entered into, in 1914, between the United States Geological Survey, the Bureau of Mines, and the Bureau of Standards, for a **co-operative study of the building-stone industry** of the country. In general, this agreement provided that the Geological Survey should study the data, compare the **classification, extent, and geology** of undeveloped and quarried deposits of **stone** and collect statistical information on production and value of output; that the Bureau of Mines should investigate all **mining and technologic data**, with special reference to safety, efficiency of operation, and prevention of waste; and that the Bureau of Standards should undertake all the **physical and chemical tests** required for determining the value of stone for structural purposes, or as aggregate for concrete. The general object of the coöperative agreement was to obtain comprehensive data on the occurrence, quality, and methods of preparation for the market of the various building-stones of the United States.

(*b*) In the preceding Serial Number liberal quotations from *Contributions of the United States Geological Survey to Architects*, by Mr. Burchard, in Vol. I of the Structural Service Book, were made.

One very important phase of Survey work on structural materials remains to be mentioned. Special investigations have been made, or are in progress, in which certain geologists spend the whole or a large part of their time at certain periods studying a single subject in a district, a state, or throughout the United States. These special investigations have resulted in the publication of *Papers* or *Bulletins* on such subjects as the **brownstones** of Pennsylvania, the Bedford oölitic **limestone** of Indiana, the Portland **cement materials** of the United States, the **gypsum deposits** of the United States, the **stone resources** of the United States (illustrated by maps showing the locations of quarries by classes of stone), the **granites** of Maine, the **granites** of the southeastern states, the **marbles** of western Vermont, the **marbles** of southeastern Alaska, **building-stones** of Minnesota, glass-sand in the Mississippi Basin, the clays of the United States east of the Mississippi River, and **slate** in the United States.

The Geological Survey also coöperates with the Bureau of Standards in the petrographic study of test samples with a view of correlating physical and chemical properties of stone with their mineral composition and texture.

(*c*) The coöperative work of these three branches of the Government began, by agreement, with an **investigation of the marble-quarrying industry** and resulted in the publication, by the Bureau of Mines, of *Bulletin No. 106*, mentioned under 3D3*b* and in tests which are being conducted by the Bureau of Standards as described under 3D1*b*. Other activities of these Bureaus are mentioned under Sandstones 3E1.

(*d*) An automatic **freezing and thawing apparatus** for testing building-stones has been designed for use by the Bureau of Standards, a description of which was given in the 1916 Report of the Director as mentioned in the Structural Service Book, Vol. I, under 2J9*d*.

(*e*) The most recent work of the Geological Survey, with special interest to architects, is a study of the **grading of the Indiana limestone**, undertaken in coöperation with the Supervising Architect's Office and the Bureau of Standards; also a report on the **marbles of the southern Appalachian states**, manuscript of which has just been completed; and a bulletin on the **granites of New England**, virtually a second edition segregated into one volume of previous bulletins on the granites of different states of that region. Preparation of this report is somewhat more than half completed.

(*f*) In the chapter on "*Stone in 1915*" of the Survey, it was stated: "The **stone industry** as a whole has advanced with the development of the country, in spite of severe competition with brick, Portland cement concrete, and certain other artificial stone products. The use of these materials has seriously affected the production of the lower grades of stone for foundations and, to a less degree, the production of building-stone of higher grade, but it has had little or no effect on the use of monumental stone."

(*g*) Due to delays incident to the war, the chapter on "*Stone in 1916*"

is not yet available, but special press notices from the U. S. Geological Survey give the following statistics as reported to G. F. Loughlin:

The value of the **stone production** of the United States in 1916 was $79,041,699, an increase of nearly 6 per cent over the figures for 1915.

(*b*) Nearly 60 per cent of the stone sold in the United States is used as **exterior building-stone, monumental stone,** and **crushed stone.** The value of **exterior building-stone** quarried and sold in 1916 was $11,715,016, which was 14 per cent of the total stone output. This was a decrease of 4 per cent compared with 1915. In 1916, 37 per cent of the exterior building-stone was granite, 40 per cent limestone, 11 per cent sandstone, and 10 per cent marble. Considerable marble that is not included in these figures was used for interior work.

In 1916 the output of **monumental stone**, both rough and dressed, was valued at $7,036,536, or about 9 per cent of the total stone output. About 70 per cent of the monumental stone is granite, and the remaining 30 per cent is marble. The above figures do not include small quantities of limestone and sandstone used for monuments.

Crushed stone, representing 37 per cent of the value of total stone quarried, was valued at $29,462,952 in 1916, an increase of 1 per cent over 1915.

Organized Bodies—Stone in General. 3A2

The ordinary man who builds knows little or nothing about stone, and frequently he cannot tell one variety of stone from another—to quote from *Stone*, a periodical devoted to the architectural uses of stone: "Truth compels the admission that a surprisingly large proportion of architects is also wofully ignorant concerning one of the most important materials of construction. These people need to be told, not once nor spasmodically, but constantly and convincingly, of the nature and physical characteristics of stone, of its eventual cheapness because of its durability, and of its beauty, fitness, and adaptability for every kind of building work. This is a task that does not belong to the individual quarry or stonemill, but to those associations that are formed to foster the interests of the entire trade."

Since the above was published, an awakening is taking place to the importance of a better understanding of the kinds of stones to be used in buildings and the best methods to be employed for their finish and setting, the number of associations has been added to, and important informative services have also been made available. Representing the interests of the stone industry in general, there are two large national organizations which contain many producers within their memberships. These are:

National Retail Monument Dealers' Association of America, Inc. 3A2a

Secretary: Frank Mallon, Port Huron, Mich.

Publications: **"Code of Ethics,"** adopted at convention in Philadelphia, 1916, sets forth fifteen principles which include: The placing of adequate foundations under all work and the striving for higher standards of design and workmanship.

Purposes: Are as described in the "Code of Ethics."

At each annual convention an exhibition is held exemplifying the progress in granite, marble, and bronze work, with especial reference to mausoleums and other monuments.

International Cut Stone Contractors' and Quarrymen's Association. 3A2b

Secretary: Wm. A. Guthrie, 1 West 42d Street, New York City.

Holds an annual convention at which addresses are given and papers read concerning developments and progress in the stone industry. Purposes, membership, and publications not stated, though mention has been seen made of a *Monthly Leaflet.*

Journeymen Stone Cutters' Association of North America. 3A2c

Secretary: W. W. Drayer, Central Life Building, Indianapolis, Ind.

Is one of the nineteen "affiliated Internationals" comprising the Building Trades Department of the American Federation of Labor, listed in the Structural Service Book, Vol. I.

Association of American Cemetery Superintendents. 3A2d

Secretary: Wm. B. Jones, "Highwood," Pittsburgh, Pa.

Publications: **"Proceedings"** of annual conventions, containing papers and discussions on the characteristics and uses of stone and on the design and care of monuments, mausoleums, and component features of cemeteries.

Purposes: To correlate information and activities in connection with the management and care of cemeteries, the preservation of trees and other elements of scenic beauty, the appropriate use of materials, and the proper placing and care of monuments and mausoleums. This Association has been described in the *"Cyclopedia of American Horticulture,"* as: "One of the three National societies conserving the landscape gardening and rural art of the country."

Information Obtainable. 3A3

(*a*) With respect to **stone for building** and other purposes, the publications of the U. S. Geological Survey are numerous and complete. Beside treating of all stone produced annually, in chapters on **Stone** in *"Mineral Resources of the U. S."* (2A1*c*), these chapters are issued separately for earlier distribution.

(*b*) It is impossible to list publications of the various State Geologists (2A2). One of them, however, refers to some deposits of **building-stone** within the state of **Mississippi**, which are described in *Bulletin No. 12*, issued by the Mississippi State Geological Survey, E. N. Lowe, Director.

(*c*) The Bureau of Standards has published *Circular No. 45:* **"The Testing of Materials"** (1A3*a*), which refers to tests of stone in general. See the different stones mentioned herein for current tests being conducted.

(*d*) A laboratory is maintained by the Office of Public Roads and Rural Engineering, Department of Agriculture, in which **tests** are made on samples **of rock**, gravel, sand, clay, etc., as mentioned under 1A3*d*.

(*e*) In the *Annual Report* of the Chief of Ordnance, Watertown Arsenal, referred to under 1A3*b* will frequently be found results of **tests on** various **building-stone.**

(*f*) See *Journal of the Society of Constructors of Federal Buildings* (1A2*d*1) for:
1. **"Setting and Pointing Stonework,"** Carl C. Holloway, November, 1914.
2. "Reports of the Committee on Stone Inquiry" which are referred to under the various stones.

(*g*) **"Stones for Building and Decoration,"** Prof. G. P. Merrill, Curator of Geology in the U. S. National Museum, Washington.

(*h*) *"Report on the Comprehensive Strength, Specific Gravity, and Ratio of Absorption of the* **Building-Stones in the United States,"** Gen. Q. O. Gilmore.

(*j*) **"Building-Stones and Clays,** *Their Origin, Character and Examination,"* E. C. Eckel.

(*k*) **"Building Stones and Clay Products:** A handbook for Architects," Heinrich Ries.

(*l*) **"Engineering Geology,"** H. Ries and T. L. Watson.

(*m*) **"Modern Stone-Cutting and Masonry,"** John S. Siebert and F. C. Biggin.

(*n*) **"Masonry and Stone-Cutting,"** E. Dobson.

(*o*) **"Engineering Contracts and Specifications,"** J. B. Johnson.

(*p*) *"Report on the* **Building and Ornamental Stones of Canada,"** W. A. Parks, Vol. I, 1912.

(*q*) **"A Handbook of Rocks,"** J. F. Kemp. 1906.

(*r*) **Among the** *pocket-books, handbooks, and other reference books,* **with sections pertaining to stone are:**
1. *Building Construction and Superintendence*, F. E. Kidder. Part I: **"Building Stones,"** pp. 205–262, 878–891; **"Cut Stone Work,"** pp. 263–310.
2. *American Civil Engineers' Pocket-Book*, M. Merriman: **"Stone Quarrying and Cutting,"** pp. 496–508.
3. *Building Trades Handbook:* **"Materials of Masonry Construction,"** pp. 145–228.
4. *Fire Prevention and Fire Protection*, J. K. Freitag. 1912.
5. *Kidder's Architects' and Builders' Pocket-Book.* 1916.
6. *The Civil Engineer's Pocket-Book*, J. C. Trautwine. 1913.
7. *The Building Estimator's Reference Book*, F. R. Walker. 1917.
8. *Handbook for Architects and Builders*, Illinois Society of Architects. Vol. XX. 1917.
9. *Mechanical Engineers' Pocket-Book*, Wm. Kent. 1916.
10. *Mechanical Engineers' Handbook*, Lionel S. Marks. 1916.
11. *Handbook of Cost Data for Contractors and Engineers*, H. P. Gillette.
12. *The Building Foreman's Pocket-Book and Ready Reference*, H. G. Richey. 1,118 pp.; illus.
13. *A Handbook for Superintendents of Construction, Architects, Builders, and Building Inspectors*, H. G. Richey.

(*s*) In several of the many volumes comprising each of the following will be found drawings, details, and descriptions of the **stone architectural masterpieces of the Old World.**
1. *Dictionaire Raisonné du Mobilier Francais*, by Viollet Le Duc.
2. *Encyclopédie de l'Architecture et de La Construction*, Directeur P. Planat.

(*t*) See, also, *Dictionary of Architecture and Building*, Russell Sturgis (1B4).

(*u*) *The Monument and Cemetery Review* contains each month plates and articles pertaining to the design and uses of stone in **monuments and mausoleums**, and in connection with **features of landscape design.** A section entitled, "Beautifying God's Acre," treats of these and other subjects of horticultural interest.

(*v*) See *Proceedings*, American Association of Cemetery Superintendents:
1. **Monuments and Other Memorials**, J. Curry. 1914.
2. **Perpetual Care of Monuments and Mausoleums**, J. C. Scorgie. 1916.

(*w*) See **Memorials and Monuments**, L. Weaver. 200 subjects chosen from seven centuries.

(*x*) See, also, **Ancient Sepulchral Monuments**, W. Brindley and W. S. Weatherly. Illustrations of over 600 subjects from various countries.

(*y*) *Other references* **to stone** will be found in some of the publications listed under "Estimating Conditions, Quantities, and Cost Data" (1D).

As to Practice Recommended. 3A4

(*a*) There has heretofore been a lack of complete and authoritative information from organized sources with respect to **building-stones** and their uses. This condition, due partly to the fact that so much of the stone produced has been used for other than building construction, is now happily being improved through the coöperative efforts referred to herein under the respective stones.

(*b*) On the subject of Stones in General the recommendations of individual writers and authorities and treatises on ancient and modern stone buildings and methods will be found under Information Obtainable.

As to Samples of Stone. 3A5

In addition to the interesting quotation from *Stone* entitled, "**Selling Stone by Sample**," as printed in Vol. I of the Structural Service Book under 2J10*a*, the following extracts of similar purport from the report of the "**Committee on Stone Inquiry**," as published in the February, 1917, issue of the *Journal of the Society of Constructors of Federal Buildings*, are of especial interest, the mention of any particular stone being omitted as the substance of the remarks applies to all:

When a contract for a building is let, the quarryman submits a **sample of stone** for approval, and, being very proud of his product and of the fact that his is the best quarry in the district, he naturally selects and sends in the very best sample of stone that he has.

This sample that has been submitted to the office comes on to the job as representing the **minimum of excellence** that shall be allowed in the building; whereas, it really represents the **maximum of excellence** that can be obtained from the quarry; and the superintendent is under bond to see that the stonework in the building corresponds with the sample.

If the office would select an **average sample** of the stone that the district can produce; if the quarrymen would select their stone for the **location** in which it is to be placed; and if the superintendent would give a little freer interpretation to the sample, the trouble would be largely overcome.

To do this, an actual knowledge of the quality of the stone is required in order to determine the various grades. It is almost as difficult for the average man to do this as it is to determine the various grades of glass.

We have asked the quarries people to submit samples representing the **grades.**

We have also requested the various quarries to submit samples to us for our guidance, showing the defects in the stone. We believe that the thing for us to do is to arrive at a **full knowledge of the qualities** of the stone; and that the more knowledge we have the less friction there will be.

Limestone. 3B

Statistics and General Activities. 3B1

(*a*) The data for 1917 are not yet available, but the **total value** of limestone produced in 1916 is estimated at $41,319,871, or over 52 per cent of the total stone production of the United States, and an increase of more than 17 per cent over the 1915 value. The value of the Indiana oölitic **limestone** quarried and sold at **Bedford** and **Bloomington** in 1916, according to a preliminary statement prepared by G. F. Loughlin, of the U. S. Geological Survey, was $3,480,525, a gain of $462,354, or more than 15 per cent, over the value for 1915.

Nearly 98 per cent of the total value for 1916 was represented by **building-stone**, valued at $3,393,576, an increase of nearly 16 per cent over 1915. The average price per cubic foot in 1916 increased from 34 to 40 cents, but the total quantity of building-stone sold, 8,545,534 cubic feet, was less by 139,679 cubic feet than the quantity sold in 1915.

The slight decrease in the quantity of Indiana oölitic limestone sold as building-stone in 1916 may therefore imply a more marked decrease in sales of other kinds of building-stone.

The stone sold in 1916 for other uses than building amounted to 212,236 short tons, valued at $86,949, a gain of nearly 43 per cent in quantity, but of only $2,203, or less than 3 per cent, in value.

The decrease in price during a year of prevailing high prices is striking, but the increase in quantity is a gratifying indication that progress is being made in utilizing stone that would otherwise be discarded as waste.

(*b*) The U. S. Bureau of Standards is now making an extensive **series of tests** on seventy-two large specimens of **Indiana limestone**, which were gathered from as many different ledges and sources in the district. It is hoped that during the current year the result of that series of tests will be available, which will naturally add materially to the general knowledge of the qualifications of Indiana limestone for every kind of structural application.

Indiana Limestone Quarrymen's Association. 3B2

Secretary: R. M. Richter, Bedford, Ind.

Publications: "**Indiana Limestone Library**," listed under Information Obtainable.

Purposes: Is a voluntary organization of producers of limestone formed for the purpose of transfusing information about this material and its application, and for promoting its greater use.

It is understood that this Association will take up officially the matter of recommendations and specifications for the setting of limestone and will welcome the suggestions or comments of architects. (See letter from Secretary under 3B5*b*.)

Bedford Stone Club Auxiliary, Inc. 3B3

Secretary: R. M. Richter, Bedford, Ind.

Organized to bring about better conditions in the limestone trade, as between the cut-stone contractor in this district and the general contractors throughout the country.

Publishes a circular enunciating these principles and giving in detail arrangements to be agreed upon with respect to the opening and scheduling of all estimates from cut-stone producers and contractors.

Information Obtainable. 3B4

(*a*) The U. S. Geological Survey (2A1*m*) has issued:

1. **The Limestone Quarries of Eastern New York, Western Vermont, Massachusetts, and Connecticut**, H. Ries. 1896. Seventeenth Annual Report, pt. 3 (continued).
2. **The Bedford Oolitic Limestone of Indiana**, T. C. Hopkins and C. E. Siebenthal. 1897. Eighteenth Annual Report, pt. 5 (continued), pp. 1050–1057.
3. **The Bedford Oolitic Limestone** (Indiana), C. E. Siebenthal. 1898. Nineteenth Annual Report, pt. 6 (continued).
4. **Limestones of Southwestern Pennsylvania**, F. G. Clapp. 1905. Bulletin No. 249, 52 pp.
5. *Cement Materials and Industry of the United States*, E. C. Eckel. 1905. Bulletin No. 243. (**Treats of limestone.**) 65 cents.
6. **Limestone and Dolomite in the Birmingham District, Alabama**, Charles Butts. 1907. Bulletin No. 315G.
7. **Oolitic Limestone at Bowling Green and Other Places in Kentucky**, J. H. Gardener. 1910. Bulletin No. 430. 60 cts.
8. **The Oolitic Limestone Industry at Bedford and Bloomington, Ind.**, J. A. Udden. 1910. Bulletin No. 430. 60 cents.
9. *Portland Cement Materials and Industry of the United States*, E. C. Eckel, with contributions by E. F. Buchard and others. 1913. Bulletin No. 522, 401 pp. (**Treats of limestone.**)

(*b*) In *Journal of the Society of Constructors of Federal Buildings* (1A2*d*1), see:

1. "**Some Notes and Letters on Bedford Stone.**" Fremont B. Ward, November, 1914.
2. "Reports of the Committee on Stone Inquiry," which treat of **limestone** (referred to under 3B5*a*).

(*c*) The Indiana Limestone Quarrymen's Association (3B2), is issuing "*The Indiana Limestone Library*," which, to date, includes:

1. "**Indiana Limestone.**" Vol. I.
2. "**Indiana Limestone Bank Book.**" Vol. IV.
3. "**Indiana Limestone Prize Residence Designs.**" Vol. XXVII

(*d*) "**A Competition for a Detached Residence of Indiana Limestone**"—The Report of the Jury of Award Announcing the Results of the Competition, Accompanied by a Reproduction of Twenty-four Prize, Mention, and Selected Designs, with 43 pages of text and illustrations, *The Architectural Review*, September, 1917.

An article describing this competition, instituted by the Indiana Limestone Quarrymen's Association, under the auspices of the above publication, with illustrations of the four prize designs, appears in the periodical, *Stone*, December, 1917.

(*e*) **Other Information** pertaining to **limestone** will be found in most of the *reference books* and others listed under and following 3A3*r*.

As to Practice Recommended. 3B5

(*a*) *Reports of the* "**Committee on Stone Inquiry.**" *Society of Constructors of Federal Buildings* (1A2*d*): This Committee was appointed in September, 1915, to investigate the limestone industry with special reference to **Indiana oolitic limestone.** In *The Journal* of this Society for January, 1916, is printed a preliminary brief report.

In *The Journal* for November, 1916, is is stated that, through the courtesy and coöperation of the Supervising Architect's Office, two members of the Committee later visited the **Indiana limestone district** and spent several days examining the various quarries and mills from which most of the marketable stone is obtained. More time was spent

in the Bedford district than in any of the others, for the reason that the majority of the best producing quarries and mills are in this district, although the Bloomington district produces considerable quantities of good stone. There are about seventy concerns doing business in these districts. Indiana limestone is found as far north as Gosport and as far south as Mitchell, a distance of approximately 50 miles, and the strip varies in width from 2 to 6 miles. Other districts, such as Ellettsville, Stinesville, and Ramona, slightly north of Bloomington, also have some good quarries, but it was not deemed necessary to visit these places, as practically the same conditions exist as in the quarries visited.

The results achieved through this trip of investigation, the coöperation afforded by the producers, and a most interesting dissertation upon the **characteristics of limestone**, its **classifications, grades, prices**, and **methods of quarrying, handling**, and **setting** occupy twelve pages in this November issue.

In the February, 1917, issue of the Society's *Journal*, containing the "Proceedings" of the eighth annual convention, thirty pages are given over to a further report by this Committee and to discussions on the subject. Reference is made to an address there given by the Secretary of the Indiana Limestone Quarrymen's Association, illustrated by motion pictures, and to an Exhibition of limestone samples held in connection with the convention. This report, submitted to the Supervising Architect, concludes with **recommendations**, among them, **as to quality, bed, samples, color, painting, handling, protection, and care of limestone.**

(*b*) *Indiana Limestone Quarrymen's Association* (3B2). **In a letter from the Secretary**, dated February 4, 1918, the following **recommendations** are offered to supplement and supersede those of last year under 2G6: "The product to be loaded on wagons, hauled and unloaded at the building-site by competent workmen and by such methods as will guard against mutilation and snipping. The stone to be stored at the building-site, whether for a few hours or for an indefinite period, so as to be entirely clear of the ground. Protection by proper means to be provided against contact with anything which would result in the accumulation of dirt, dust, soot, mud, or other staining agents. During extended periods of storage at the site, the product to be covered by tarpaulins, stout paper, or boards, as a protection against rain or snow.

"**Indiana Limestone** to be set in carefully prepared lime-mortar, tempered with 10 per cent stainless cement, and set in the wall without painting. After set, apply one heavy coat of hot asphalt heated on the premises, so as to cover all exposed rear portions of the stonework as well as all joints in the rear. If desired, a one-half inch coat of lime-putty may be applied uniformly across the exposed rear surfaces after the painting has been done and before the backing is laid. Cover the walls of the building in course of erection each night and at all times during cessation of work in order that rain, snow, or frost may be prevented from percolating through the backing and stonework.

"After the building is completed, clean the stonework with clear water in which any well-known brand of scouring-powder has been dissolved and boiled, applying same by vigorous scrubbing with stiff fiber brushes. After the cleaning has been completed, wash down the walls with clear water through a hose. The use of acids of any kind and in any proportion to be prohibited. If much wet weather was encountered during the erection of a building, the preferable practice is not to undertake a thorough cleaning process until improved weather conditions have given the stonework a reasonable opportunity to dry out."

Granite. 3C

Complete statistics of the granite production in the United States for 1916 are not yet available though preliminary reports as to some of the states have been issued by the U. S. Geological Survey, and the total valuation has been placed at $17,418,582.

In 1915, the granite production was valued at $17,864,000, divided as follows (by millions): Building 4.7, monumental 4.87, paving 2.35, crushed 3.82, the balance in curbing, flagging, rubble, and riprap.

In connection with this industry there exist the following national and local organizations:

The National Association of the Granite Industries of the United States, Inc. 3C1

Secretary: Robert D. Smith, 161 Devonshire Street, Boston, Mass.

It is the purpose of this organization to associate in a central body all persons, firms, or corporations engaged in carrying on the granite industry with respect to quarrying, manufacturing for building and paving work, and manufacturing for monumental purposes, in any part of the United States.

National Building Granite Quarries Association, Inc. 3C2

Field Secretary: John S. McDaniel, 31 State Street, Boston, Mass.

Purposes: "To search continually for what architects want to know about granite and to put this information in concise, interesting, and intelligent form; to promote the use of granite for building purposes, only in so far as the proper presentation of useful information carries its own conviction; and to encourage a larger use of granite by expanding the Association's facilities to serve the architectural profession."

Is one of the Associations indorsing the third edition of the *Standard Documents* of the American Institute of Architects.

Granite Manufacturers Association of Barre, Vermont. 3C3

Secretary: Harold P. Hinman, Barre, Vt.

Publications:

(*a*) A house organ known as **"Barre Granite"** for distribution to members and discussion of the affairs of the Association.

(*b*) **"Memorial Masterpieces,"** and other literature.

Consists of over 97 per cent of the quarry-owners and manufacturers in the Barre granite center, to promote the best interests of the Barre granite industry. Coöperates with the quarry owners' Association in a campaign to increase the volume of sales and to improve the quality of memorial and building work.

Barre Quarriers' and Manufacturers' Association. 3C4

Secretary: Harold P. Hinman, Barre, Vt.

(See Association just described under 3C3.)

Granite Paving Block Manufacturers' Association of U. S., Inc. 3C5

Field Secretary: Walter L. Weeden, 31 State Street, Boston, Mass.

Local Granite Associations. 3C6

It is stated that some of these, concerning whose activities and publications we have not heard, exist in **Hardwick**, Vt.; **Milford**, N. H.; **Concord**, N. H.; **Quincy**, Mass.; and **Westerley**, R. I.

Granite Cutters' International Association of America. 3C7

President: James Duncan, Hancock Building, Quincy, Mass.

Is one of the nineteen "affiliated Internationals" comprising the Building Trades Department of the American Federation of Labor, listed in the Structural Service Book, Vol. I.

Information Obtainable. 3C8

(*a*) The U. S. Geological Survey (2A1*m*) has published the following:

1. **The Granite Industry of the Penobscot Bay District, Maine**, G. O. Smith. 1905. Bulletin No. 260. (Exhausted.)
2. Recent work on **New England Granites**, T. N. Dale. 1907. Bulletin No. 315J, pp. 356–359.
3. **The Granites of Maine**, T. N. Dale. 1907. Bulletin No. 313, 202 pp. 35 cents.
4. *The Chief Commercial* **Granites of Massachusetts, New Hampshire, and Rhode Island**, T. N. Dale. 1908. Bulletin No. 354, 228 pp.
5. **The Granites of Vermont**, T. N. Dale. 1909. Bulletin No. 404, 138 pp. 20 cents.
6. *Supplementary Notes on the* **Granites of New Hampshire**, T. N. Dale. 1910. Bulletin No. 430, pp. 346–372. 60 cents.
7. **Granites of the Southeastern Atlantic States**, T. L. Watson. 1910. Bulletin No. 426, 282 pp.
8. *Supplementary Notes on the* **Commercial Granites of Massachusetts**, Bulletin No. 470, pp. 240–290. 1911.
9. **The Granites of Connecticut**, T. N. Dale and H. E. Gregory 1911. Bulletin No. 484, 137 pp.
10. **The Aberdeen Granite Quarry**, *near Gunnison, Colo.* J F. Hunter. 1913. Bulletin No. 540, pp. 359–362. 45 cents.
11. See, also, chapters on **"Stone"** in *"Mineral Resources of the U. S."* for each year. (2A1*c*, *d*.)

(*b*) **"History of the Granite Industry of New England,"** Arthur W. Brayley.

(*c*) See *Proceedings*, Association of American Cemetery Superintendents (3A2*d*), 1917, **article on granite** by Professor Perkins, State Geologist of Vermont.

(*d*) **Other Information** pertaining to **Granite** will be found in most of the *reference books* and others listed under 3A3*r* to *y*.

With respect to the interesting use of crushed pink granite as an aggregate to secure color-tones in stucco, see references in Serial No. 2, under 2B7*u*3, 4, and under 2D5*o*.

As to Practice Recommended. 3C9

(*a*) *Report of the* **"Committee on Granite Inquiry"**—*Society of Constructors of Federal Buildings.*

In view of the fact that the 1918 convention of the Society was indefinitely postponed, the report of the Committee on Granite, which was to have been presented for discussion at the convention, was printed in the September–December, 1917, *Journal*, so that members (and

under the unusual conditions, any other persons interested) might submit written questions and discussions, which will be printed in the *Journal* during the coming year.

This Committee, appointed in January, 1917, for the purpose of investigating the granite quarries and the fabrication and uses of granite, had no definite instructions, except to cover generally the investigation of the entire industry and obtain all information that might be of use and interest to the members, and ascertain if the specifications as generally used for construction of federal buildings were ample to meet the various economic features as they occur in the production and fabrication of granite.

The interesting report covers seventeen pages in the *Journal*, and treats of such features as: **"Structure of Granite Masses," "Structure of the Stone," "Texture," "Rift and Grain," "Extraction from the Quarry," "Fabrication,"** and **"Specifications."**

The Committee found, despite the fact that the granite industry is suffering a considerable depression, that there is still a demand for granite where a durable material is required, and the resumption of the use of granite for paving-blocks attests the high regard for this material as suitable for a wearing surface for heavy traffic.

(*b*) From letters written by prominent **granite-producing concerns** who have offered **suggestions** in connection with the use of **granite**, we quote the following:

(*c*) "Considerably **more granite** might be used **in building work** if the class of cutting were not specified to be too fine. For the average building, where the appropriation is not unlimited, good results in the appearance of the granite facing of a building may be obtained by **graduating** the class of **cutting**, starting at the ground-level and making it coarser toward the top of a building. There must necessarily be a belt-course or an entablature or other horizontal line around the building where the change in the class of cutting is to occur. It is a well-recognized fact by many architects that a coarse finish at a number of feet from the ground-level has about the same appearance as a finer finish near the level of the eye. Therefore, why should the extra money be put into a class of cutting which is unnecessary above a certain height?

"Both marble and limestone, which are sawed, are used in thin courses. Many, if not most, of the large building granite manufacturers have saws, and we believe that this style of **thin ashlar**, alternating the courses so that they will bond well, should be used in a granite facing as well as in a marble or limestone facing."

Marble. 3D

Statistics and Governmental Activities. 3D1

(*a*) The U. S. Geological Survey states that the **value of** the **marble** sold by producers in 1916, according to reports from eighty active marble quarries, was $7,033,171. This was an increase of nearly 2 per cent compared with 1915, but was less than the value of any of the four preceding years.

The **principal** producing state is **Vermont**, the value of whose marketed product in 1916 represented over 43 per cent of the total value, and showed an increase of nearly 10 per cent in value over 1915. **Tennessee**, with a value of $1,000,266, representing an increase of 4 per cent, was the next state in rank, and **Georgia**, with a value of $903,343, a decrease of 7 per cent, was third.

These three states produce 70 per cent of the total marble output, although twelve other states produce this stone, the greater part of which is used for building or monumental work. The terrazzo stone, used to mix in with mortar in making floors, amounted to 24,340 short tons.

(*b*) The Bureau of Standards in its *1917 Report* states:

1. In connection with the coöperative investigation of building-stones which is being carried on with the U. S. Geological Survey, Bureau of Mines, and Office of Public Roads, fifty samples of **commercial marble** have been **tested** to determine their compressive **strength** in a dry and wet state, transverse strength perpendicular and parallel to the bedding, tensile strength perpendicular and parallel to the bedding, percentage of **water absorption, specific gravity, porosity, weight** per cubic foot, electrical **conductivity**, coefficient of **expansion**, resistance to **frost-action**, resistance to the penetrations of **stains**, and chemical composition. A report on these tests is now being prepared for publication.
2. "A **collection** of the various commercial **marbles** has been made and placed **on file** at the Bureau of Standards. This collection at present consists of seventy-five polished slabs, 8 by 12 inches, and represents the principal commercial marbles of Vermont, Massachusetts, New York, Maryland, Georgia, North Carolina, Alabama, Missouri, Colorado, and California. This collection is now exhibited in suitable cases and **may be examined** by those interested in studying and comparing the various types of American marble."

(*c*) In the *"Yearbook of the Bureau of Mines,"* by Van. H. Manning (1916), it is stated that "The presence of vast piles of **waste marble** at many quarries indicates the two important phases of the problem: First, the desirability of reducing waste by introducing **improved quarry methods**, and, second, the need of **utilizing accumulations** of waste material. The bureau has shown that the proportion of waste may be reduced by intelligent prospecting and by separating blocks in accordance with rock structures. Blocks containing imperfections may be employed for riprap, road-building, lime-burning, soil-amendment, furnace-flux, rubble, and various other uses."

For **investigations of marble quarrying** by the Bureau of Mines see 3A1*c* and resulting *Bulletin* mentioned under 3D3*b*.

Organized Bodies. 3D2

In the marble industry there appears to be no national association composed entirely of producers. There exists, however, the first-named below national association of dealers.

National Association of Marble Dealers. 3D2a

Secretary: Wm. A. Davis, 1328 Broadway, New York City.

Publications:

1. *"Code of Practice"* adopted at the annual meeting in New York, November 11, 12, 1915. Copies furnished upon request.
2. *"Agreement"* copies of which may be had upon request.
3. *Bulletins* to members at frequent intervals.
4. *Marble*, a monthly publication.

Activities confined to interior marble. Has prepared, adopted, and circulated the "Code of Practice" above mentioned which governs conditions of estimating, awarding of contracts, grades of marble and workmanship.

The membership includes practically all of the important dealers in the United States, exclusive of New York City and the Pacific coast; also includes quarriers, many of whom are finishers as well.

In September, 1913, this Association entered into a five-year agreement (referred to above) with the Bricklayers', Masons', and Plasterers' Union, establishing a standard wage-rate throughout the country for the installation of marble.

The Association has indorsed the *Standard Documents* of the American Institute of Architects and looks forward to their more complete use as a solution of many controversies not now eliminated by the *"Code of Practice,"* which establishes arbitration methods for settling disputes as to the grades and workmanship of marble.

Marble Industry Employers' Association. 3D2b

Secretary: Wm. K. Fertig, Cameron Building, New York City.

This local association, comprising the marble dealers of New York, is independent of the National Association before referred to.

International Association of Marble and Stone Polishers, Rubbers, and Sawyers. 3D2c

President: S. C. Hogan, 406 E. 149th Street, New York City.

Is one of the nineteen "affiliated Internationals" comprising the Building Trades Department of the American Federation of Labor, as listed in the Structural Service Book, Vol. I.

Note.—The Bricklayers', Masons' and Plasterers' International Union referred to under 3D2*a*1, in connection with the agreement described, is listed in this issue under 3H3*l*.

Information Obtainable. 3D3

(*a*) The U. S. Geological Survey (2A1*m*) issues:

1. **Tennessee Marbles**, Arthur Keith. 1903. Bulletin No. 213, pp. 366–370. (Exhausted.)
2. **Marble of White Pine Country, Nev.**, near Gandy, Utah, N. H. Darton. 1908. Bulletin No. 340G, pp. 377–380.
3. **Marble in Chiricahua Mountains, Arizona**, D. Sidney Paige. 1909. Bulletin No. 380, pp. 299–311. 40 cents.
4. **Variegated Marble Southeast of Calera, Shelby County, Ala.**, Charles Butts. 1911. Bulletin No. 470, pp. 237–239.
5. **The Commercial Marbles of Western Vermont**, T. N. Dale. 1912. Bulletin No. 521, 170 pp.
6. **Ornamental Marble near Barstow, Cal.**, Robert W. Pack. 1913. Bulletin No. 540, pp. 363–368. 45 cents.
7. **The Calcite Marble and Dolomite of Eastern Vermont**, T. N. Dale. 1915. Bulletin No. 589, 67 pp.
8. See also chapter on **"Stone"** in *"Mineral Resources of the U.S.,"* for each year (2A*c*, *d*).

(*b*) The Bureau of Mines in its investigation of problems connected with the mining and technology of various building-stones has issued the following, which will be found descriptive of the production and more efficient use of this material:

1. **"The Technology of Marble Quarrying."** Bulletin No. 106.

(*c*) As to the **care of** interior and exterior **marble**, see "Care and Operation of Federal Buildings," by Julian Morton, in *Journal of the Society of Constructors of Federal Buildings*, July, 1915.

(*d*) See **"Marble and Marble Workers,"** W. S. Renwick.

(*e*) **"Notes on Domestic White Building Marble,"** Topic 1081, Bulletin of Building Data League.
(*f*) See references to the **"Code of Practice"** and **"agreement"** mentioned under National Association of Marble Dealers (3D2*a*).
(*g*) **Other information** pertaining to **marble** will be found in most of the *reference books* and others listed under 3A3*r* to *y*.

Standard Details. 3D4

The Departments of the Treasury, War, and Navy, U. S. A., have issued Uniform Specifications for Plumbing Fixtures, which include **Standard Details** for water-closet, shower-bath, urinal and bath **inclosures**, as described under 3G6*a*.

Terrazzo and Marble Floors. 3D5

(*a*) An interesting series of papers on the use of **marble in flooring**, with suggested **specifications**, by Charles A. Marsh, Ernest L. Hesse, Carl C. Holloway, and David C. Trott, is contained in *Journal of the Society of Constructors of Federal Buildings* (1A2*d*1) for November, 1914; and a paper on "A Recent Experience with **Terrazzo Work**," by John E. Langley, will be found in the May, 1915, issue of same.

(*b*) For information on the **cleaning** of marble **floors, stair-treads**, and **sand-finished marble**, see paper on "Care and Operation of Federal Buildings" (3D3*c*).

Sandstone. 3E

Statistics and Governmental Activities. 3E1

(*a*) **Sandstone** valued at $5,603,778 was produced and sold in the United States in 1916, according to G. F. Loughlin, of the U. S. Geological Survey. This was a decrease of 8 per cent compared with 1915, and was the lowest figure for this kind of stone since 1897.

In two of its principal uses—as **curbing** and as **flagging**—sandstone has in recent years been replaced by cement, a fact that accounts in large measure for the decrease in the production of this kind of stone. In 1916 the production of sandstone represented 7 per cent of the total output of stone, and the principal producing states, which contributed 59 per cent of the total output, were Pennsylvania ($1,318,239), Ohio ($1,274,181), and New York ($714,558).

(*b*) In *Report of the Bureau of Standards, 1917*, it is stated: "Thirty-five **samples of sandstone** have been **collected** from the important quarries of the United States, and the work of preparing test specimens is well under way. The physical properties of these will be determined in approximately the same manner as those of the marble."

(*c*) In *Yearbook of the Bureau of Mines, 1916*, it is stated: "During the summer of 1915 a **study of sandstone quarrying** was begun. About fifty-five sandstone quarries were visited by the Bureau's quarry technologist, and investigations were made of all phases of the industry, including the physical properties and imperfections of sandstone and their effect on quarry operations. Methods of quarrying bluestone and ganister were also observed.

"These investigations disclosed a condition of excessive **waste** in many sandstone regions, the proportion in some instances reaching 75 per cent of the gross production. The gravity of this condition is intensified by the limited number of uses for which waste sandstone may be employed. The imperative need and the means of so improving quarry methods that the proportion of waste may be greatly reduced are emphasized. A study of the cause and prevention of accidents was conducted in conjunction with the efficiency and waste investigations." The result of the studies and observations made are embodied in a report on "Sandstone Quarrying in the United States," listed under 3E3*b*.

Bluestone. 3E2

(*a*) A **fine-grained sandstone** quarried in New York and northeastern Pennsylvania, **known locally as "bluestone,"** was produced in 1916 to the value of $510,011, according to the U. S. Geological Survey. This represented a decrease of about 21 per cent, compared with 1915, and followed a decrease of over 40 per cent in that year.

(*b*) **"Flagstone"** is a name very commonly misapplied. This term should be considered as referring to the treatment rather than the stone, for to the trade this means any good bluestone or other sandstone, which has natural split surfaces on the flat exposure and bed and the thickness of which runs within the limitation of about 1½ to 4 inches. Above this thickness it becomes bluestone stock.

Information Obtainable. 3E3

(*a*) The U. S. Geological Survey (2A1*m*) has published:
1. **The Sandstones of Western Indiana,** T. C. Hopkins. 1896. Seventeenth Annual Report, pt. 3, pp. 780–787.
2. **Brownstones of Pennsylvania,** T. C. Hopkins. 1897. Eighteenth Annual Report, pt. 5, pp. 1025–1043.
3. **Sandstone** is discussed in *"Structural Materials Available near Minneapolis,"* in Bulletin No. 430. 1910. 60 cents.
4. See, also, chapters on **Stone** in *Mineral Resources of the U. S.* for each year (2A1*c*, *d*).

(*b*) The Bureau of Mines (2A3) has issued: *Bulletin 124:* **"Sandstone Quarrying in the United States,"** O. Bowles. 1917. 143 pp.; illus.
(*c*) The Ohio State Survey, Prof. J. A. Bownocker, State Geologist, Columbus, Ohio, has published a *bulletin on "Building Stones,"* in which **sandstone** is referred to.
(*d*) See *Journal of Society of Constructors of Federal Buildings* (1A2*d*1) for:
1. **"How Sandstones Differ,"** May, 1916.
2. "Reports of Committee on Stone Inquiry," referred to under 3B5*a*, touch on **sandstone.**

(*e*) **Other information** pertaining to **sandstone** will be found in most of the *reference books* listed under 3A3*r*.

Soapstone. 3F

(*a*) In the production of soapstone the United States ranks first among all countries, and Virginia produces about twenty times as much as the four other producing states—Maryland, North Carolina, Rhode Island, and Vermont. The waste from breakage in quarrying, sawing into slabs, manufacturing, and final transportation is so great as to render success in the industry a matter of skilful manipulation. The value of the stone is in large measure proportionate to the work done upon it. In the rough it is valued at $2 or less a ton, but when sawed into slabs its value is increased to about $15, and when made into laundry-tubs it may attain a value of about $30 a ton. The production of soapstone and talc in the United States is steadily increasing.—U. S. Geological Survey, Press Bulletin, November, 1916.

(*b*) *Standard Details.* The Departments of the Treasury, War, and Navy, U. S. A., have issued Uniform Specifications for Plumbing Fixtures which include **Standard Details** for water-closet, shower-bath, urinal and bath **inclosures**, as described under 3G6*a*.

Slate. 3G

Statistics and General Information. 3G1

(*a*) From *Slate in 1916*, advance chapter of *Mineral Resources of the U. S.* published by the U. S. Geological Survey, the following extracts are given:

The **total value of slate** sold in 1916 amounted to $5,338,837. There was an increase of more than 26 per cent in quantity and of 44 per cent in value of mill stock, which in 1916 amounted to 5,782,842 square feet and exceeded the quantity sold in seven of the nine preceding years. This encouraging increase in **mill stock** was offset by decrease in sales of **roofing slate**, whose value represents a little over three-fifths of the total.

The increased cost of metals, the demand for them in other uses, and the increased cost of asbestos and other materials used in artificial roofing may give **roofing slate** an opportunity to regain some of this lost ground. Slate, either in ordinary shingles, as inlaid slate, or as filler for asphaltic roofing material, is available for use on roofs of all kinds.

(*b*) **The slate production** of the United States is practically confined to the northeastern part of the country, Pennsylvania and Vermont leading the states. Although scattered deposits, more or less developed, occur elsewhere, this eastern slate is shipped to supply markets on the western coast as well as in the central and southern parts of the country. The slate of most of the deposits in the various states has been described either in *Bulletin No. 586* of the U. S. Geological Survey or in previous reports on the slate industry. Slate is classified as **roofing slate** and **mill stock**, and the use for these different purposes depends largely, although not entirely, on the character of the slate, as mentioned under (*c*) and (*d*) quoted from *Slate in 1915*.

(*c*) *Mill Stock:* **"Mill Stock** requires a finer, more even-grained, and more compact material than roofing slate, and a material with a smooth cleavage surface. It must be of a fairly uniform color and not too hard to be easily worked by the slate-dressing machinery. The slates of Maine and Vermont and the 'soft-vein' slates of Lehigh and Northampton counties, Pa., are well adapted for mill stock, and these slates are also among the best of the roofing slates. The Arkansas slate has been used both for electrical and roofing purposes, and the Maryland and New York quarries also furnish a small quantity of mill stock.

"Mill stock includes slate used for blackboards, school slates, flooring, wainscoting, vats, tiles, sinks, laundry-tubs, grave-vaults, sanitary ware, refrigerator shelves, flour-bins and dough-troughs for bakeries, electrical switch-boards, mantels, hearths, well-caps, and tops for billiard, laboratory, kitchen, and other tables.

"Lehigh and Northampton counties, Pa., report the only stock produced for school slates and blackboards. The quarries in these counties can best produce this material on account of the unusually fine cleavage of the slate and the thickness and size of the beds."

(*d*) *Roofing Slate:* **"Slate used for roofing** is not necessarily of so fine a texture nor of so smooth a cleavage as the mill stock, but it must be hard, strong, and tough, and should not contain carbonates or iron pyrites, which decompose or oxidize under atmospheric conditions. A description of the process of dressing roofing slates was given in the report on slate in *Mineral Resources of the U. S.* for 1911."

(*e*) *Graduated and Variegated Roofing Slate.* A decided impetus has in recent years been given the roofing slate industry through the activities of a few resourceful producers who have coöperated with some architects in procuring **distinctive roofs.** The effect desired is obtained by utilizing to the full the materials with which the quarries abound, including the largest range of color and varying sizes and thicknesses. Notes on certain kinds of roofing known as the "Old English Method" will be found in "Kidder's Pocket-Book," 1916, page 1498.

(*f*) A progressive producing concern informs us that it has in preparation a booklet to be illustrated with reproductions of panels of uniform size laid with **different sizes** and **thicknesses** of slate; also showing examples of use of **"random" widths.**

It also states: "Many architects specify familiar sizes, such as 20 x 10 inches, and refuse to take any others. This habit seriously handicaps the beauty and availability of slate roofing. As slate comes from the quarry in masses of entirely irregular size and shape, the slatemakers are obliged to split and 'trim' (square up) each block of slate quarried into perhaps three or four out of thirty-five commercial sizes, as may be least wasteful. Hardly 10 per cent of the quarry-run can be split to a given size, especially a large size, and in consequence it is slow and expensive to work upon one-size orders. If architects would permit quarrymen to fill orders in two or three **different lengths,** and **'random' widths** (as in laying shingles), according to the general dimensions of roof to be covered, the latter could fill even large orders at comparatively short notice, as they could put in from 70 to 80 per cent of daily output instead of 8 to 10 per cent.

Organized Bodies. 3G2

In this industry no national organization appears to exist, and indeed it seems doubtful whether any local organized bodies of producers, save the first-named below, are now in active existence, though some have at times been formed.

Bangor Slate Association, Inc. 3G3

Secretary: L. M. Cowling, Bangor, Pa.

Publications: (*a*) **"Booklet"** mentioned under 3G5*d*, and (*b*) **"Specifications"** referred to under 3G6*g*.

Purpose: To give out information about genuine Bangor slate and to see that it is used when specified is the object of this Association which is composed of producers in this locality who manufacture slate for roofing or structural purposes.

International Union Slate and Tile Roofers. 3G4

Secretary: J. M. Gavlak, 3643 W. 47th Street, Cleveland, Ohio.

Is one of the nineteen "affiliated Internationals" comprising the Building Trades Department of the American Federation of Labor.

Other Information Obtainable. 3G5

(*a*) In addition to chapters on slate in "Mineral Resources of the U. S." (2A1*c*) and similar chapters separately printed (2A1*d*), the following are selected from publications of the U. S. Geological Survey (2A1):

1. "Chemical Notes on the **Composition of the Roofing Slates** of Eastern New York and Western Vermont," W. F. Hillebrand. 1899. *Nineteenth Annual Report*, pt. 3, $2.25.
2. **"The Slate Belt of Eastern New York and Western Vermont,"** T. N. Dale. 1899. *Nineteenth Annual Report*, pt. 3, pp. 153–200. $2.25.
3. **"The Slate Industry** of Slatington, Pa., and Martinsburg, W. Va.," T. N. Dale. 1903. *Bulletin No. 213.* (Exhausted.)
4. "Notes on Arkansas **Roofing Slates,"** T. N. Dale. 1904. *Bulletin No. 225*, pp. 414–416. 35 cents.
5. **"Slate Deposits** of California and Utah," E. C. Eckel. 1904. *Bulletin No. 225*, pp. 417–422. 35 cents.
6. **"Slate Investigations** During 1904," T. N. Dale. 1905. *Bulletin No. 260*, pp. 486–488. (Exhausted.)
7. "Note on a **New Variety of Maine Slate,"** T. N. Dale. 1906. *Bulletin No. 285*, pp. 449–450. (Exhausted.)
8. **"The Slates of Arkansas,"** A. H. Purdue. 1910. *Bulletin No. 430*, pp. 317–334. 60 cents.
9. **"Slate Deposits and Slate Industry of the United States,"** T. N. Dale and others. 1914. *Bulletin No. 586.* A revised edition of Bulletin No. 275.

(*b*) The State Geological Surveys (2A2) of **Arkansas, California, Maryland,** and **New Jersey** have published descriptions of the slate and the slate deposits of these states.

(*c*) **"Building-Stones and Clays, Their Origin, Character, and Examination,"** E. C. Eckel. Contains a chapter on slate.

(*d*) The Bangor Slate Association, Inc. (3G3) issues, for general distribution, a *Booklet* entitled **"Genuine Bangor Slate."**

(*e*) **"Slate as a Roofing Material**—The Color, Texture and Charming Irregularities That Can Be Produced in a Slate Roof Well Laid," Romer Shawhan, *House and Garden*, November, 1917. Illus.

(*f*) For descriptions in minute detail with diagrams and profuse illustrations of **foreign practice** in the **cutting and laying of slates** for roofing with hips, ridges, valleys, gutters, and all accessories of wood, metal, and other materials, see *Traité de Couverture et Plomberie*, by Oslet and Lascombe, 2 Vols.

(*g*) **Further Information** pertaining to slate and its uses will be found in most of the *reference books* listed under 3A3*r*.

Practice Recommended and Standards Adopted. 3G6

(*a*) The Board on **Uniform Plumbing Specifications,** composed of representatives of the Treasury, War, and Navy Departments, issued, March 1, 1916, *"Specifications for Plumbing Fixtures, etc., for the Treasury, War, and Navy Departments."* It is interesting to note that these specifications, which are described in the *Structural Service Book*, Vol. I, under 9A, and will be referred to in the Serial on Plumbing this year, contain several plates showing standard details for **inclosures and stalls** for **water-closets, shower-baths, urinals,** and **bathtubs.** These are adaptable for either slate, marble, soapstone or glass, as may be called for by the specifications for the particular building in which they are to be erected, and are so used by these three departments and by some architects in their regular practice.

(*b*) The Department of the Navy, U. S. A., issues a specification for **roofing slate** of which a verbatim transcript is:

Roofing Slate—Navy Department Specifications. Serial Designation 5981, February 1, 1915.

General: (1) Slate shall be of the dimensions specified, not less than $\frac{1}{4}$ inch thick, best quality, uniform in size, color, texture, and composition; sound, dark blue or black, or other color desired. Tails and edges shall be cut square and true. Nail-holes shall be drilled and countersunk for the heads of nails. Slate shall be free from warped surfaces; quartz ribbons, or quartz particles, and the presence of injurious carbonates and sulphides shall be cause for rejection. Where unfading slate is desired, or the slate is to be exposed to acid fumes, slates which effervesce with hydrochloric acid applied as follows shall be rejected: Hydrochloric acid having a specific gravity of about 1.20 at 60° F. or about 38 per cent of absolute acid is to be diluted so that 60 per cent by volume of the diluted acid shall be water. This acid is to be applied to the freshly broken edges of the slate.

Trade Name: (2) Bidders shall state trade name of slate, name and locality of quarry, and, where required, submit sample of the slate which they propose to furnish.

NOTE.—Copies of the above specifications may be obtained as mentioned in the Structural Service Book, Vol. I, under 3A1*a*.

(*c*) The U. S. Geological Survey in *Mineral Resources of the U. S., 1915*, states:

1. *Measurement and Size of Roofing Slate.*—"Roofing slate is sold in the United States by the 'square,' a **'square'** being a sufficient number of pieces of slate of any size to cover **100 square feet** of roof, with allowance generally for a 3-inch lap. The size of the pieces of slate making up a square ranges from 7 by 9 inches to 16 by 24 inches, and the number of pieces in a square ranges from 85 to 686, according to the size of the pieces. The ordinary thickness of a piece is from $\frac{1}{8}$ to $\frac{1}{4}$ inch, and the approximate **weight** per square is about 650 pounds."

2. *Thicknesses.*—"It has been suggested that a **failure to recognize** a certain **minimum thickness** for slates has been unfavorable to the industry; that some producers are in the habit of splitting their slates too thin; and that the insistence by architects and the general public on **thicker slates** would result in much less breakage, a higher standard of splitting and sorting slates, and the marketing of a product of higher grade. The minimum thickness suggested is three-sixteenths of an inch for the strongest slates and fully a quarter of an inch for the common slates of somewhat less strength. The growing demand for thicker slates to produce rough effects should assist in this development of the industry."

(*d*) In *"Kidder's Pocket-Book,"* 1916, p. 1499, it is stated:

1. *Laying Cost of Roofing Slate.*—"The **square** is also the **basis** on which the **cost of laying** is measured. 'Eaves, hips, valleys, and cuttings against walls or dormers are measured extra; 1 foot wide by their whole length, the extra charge being made for waste material and the increased labor required in cutting and fitting. Openings less than 3 square feet are not deducted, and all cuttings around them are measured extra. Extra charges are also made for borders, figures, and any change of color of the work and for steeples, towers, and perpendicular surfaces.' "

(*e*) In *Manual* of the American Railway Engineering Association (1A2*c*3) the Committee on Buildings states:

As to Slope. "Slate and tile of suitable quality, properly protected and fastened, can be recommended on roofs **with a pitch of six (6) inches** to the foot or over, where expense is not the governing feature, and where they aid in producing the desired architectural effect, except that where there is much chance of driving snow, **eight (8) inches** to the foot should be the flattest slope allowed."

(*f*) See publications of the National Board of Fire Underwriters:

1. *Building Code Recommended, 1915:* Part XV, **"Roofs and Roof Structures,"** pp. 102–108.

2. *Dwelling Houses, A Code of Suggestions for Construction and Fire-Protection of 1916:* Part IV, "**Roofings, Approved Fire-resistive Materials** for," p. 135.

(*g*) The Bangor Slate Association, Inc. (3G3):

1. Specifications for "**Genuine Bangor Slate Roofs for Flat Roofs**" (over concrete and over sheathing).

(*h*) *Flat Surfaces.*—Slate is being much used for **flat roofs** and for **terrace paving, garden walks** and similar purposes. Concrete underfills for latter uses will be referred to in a later Serial Number, and specifications for flat-roof treatment have been developed by slate companies in collaboration with the Barrett Manufacturing Company, which are similar to those used in constructing the roof illustrated on p. vii of the Industrial Section.

Brick, Hollow Tile, and Architectural Terra Cotta. . . . 3H

Statistical Data and Governmental Activities. 3H1

(*a*) In the 1917 issues of the Structural Service Department, **brick, hollow tile,** and **architectural terra cotta** were described in connection with "Fire-resistive Construction," forming one-half of "*Fire Prevention and Protection*" which appeared in two issues. This year one issue, May, will be devoted entirely to that subject, after wood has been taken up in Serial No. 4, April. Burnt-clay products other than those under this heading will be referred to in later Serial Numbers in connection with other branches of construction, such as pottery and soil-pipe under Plumbing, wall-, floor-, and roof-tile under Plastic Products. The application of clay products to fire-prevention and -protection, as well as the use of all products previously treated, and of wood in the same connection, will be dealt with fully under "Fire-Prevention and -Protection" in Serial No. 5.

(*b*) In "*Clay-Working Industries and Building Operations in the Larger Cities in 1916*," by Jefferson Middleton, being advance Chapters from *Mineral Resources of the U. S. 1916*, Part II, it is stated that:

The **total value** of all **clay products** marketed in 1916 was $207,260,091, an increase of nearly 30 per cent over 1915. The special features to be noted are the large increase of common building-brick and fire-brick, and that the output of common brick in Cook County, Ill., in 1916, was 130,568,000 more than in the New York portion of the Hudson River region. Other features are the increase in engineering and refractory products and clay structural materials.

There is especial mention of the increase of clay products due to their use for fire-prevention purposes.

(*c*) The *Annual Report of the Director, Bureau of Standards, for 1917*, contains information from which the following extracts are made:

1. *Strength of Brick Piers.*

An investigation of the load-bearing value and other properties of large **brick piers** has been completed and is being prepared for publication. This investigation was conducted in coöperation with the National Brick Manufacturers' Association, and includes tests of fifty brick piers of large size. In the construction of these piers, three grades of brick from each of the four widely separated districts east of the Mississippi River were used.

A study was made of various types of **bonding** and of different grades of **mortar.** Numerous auxiliary tests were made on the materials.

Of the mortars used, the **cement-mortar** develops about twice the strength of the **lime-mortars,** of 2,700 and 1,400 pounds per square inch, respectively, for the highest grade of brick. The cement-mortar is harder to work, however, and a **combination lime- and cement-**mortar which does not appreciably affect the strength of the piers is cheaper and has much better working qualities. The combination used in the present investigation was 1 part of cement and lime (by volume 65 and 35 per cent, respectively), to 3 parts sand. The strength of piers laid in the combination cement- and lime-mortar are practically the same as those laid in a 1 : 3 cement-mortar, giving twice the strength of those laid in 1 : 6 lime-mortar, and about four times the strength of those laid in 1 : 3 lime-mortar. The type of bond, as concerns the number of header courses used, has little, if any, effect upon the ultimate compressive strength of piers. The introduction of wire mesh in the horizontal joints adds strength if used in all the joints. This does not apply, however, if used in every third or fourth course only, and may even decrease the strength of the pier. The transverse rather than compressive strength of the individual brick is believed to bear the closer relation to the ultimate strength of brick masonry.

2. *Study of American Clay Refractories.*

For the purpose of assisting in the classification of American **clay refractories,** a large number of **firebricks** have been examined with reference to their softening temperature, their ability to resist a pressure of 40 pounds per square inch at 1,350 degrees C., and their volume and porosity at various temperatures up to 1,500 degrees C. Since most of the domestic makes are represented in this series of tests, the information should be of a fundamental character and useful in the preparation of specifications governing their use.

3. *Sand-Lime Brick.*

It is believed that **sand-lime brick** of better quality and less cost can be made by improving the methods of manufacture. An investigation was first undertaken to determine the effect of various factors upon the properties of a brick-made lime and sand, both of very fine size of grain, that is, smaller than 200 mesh. A decidedly stronger brick was obtained with a composition of equal parts by weight of lime hydrate and sand than with any other proportion. The best molding pressure was found to be 10,000 pounds per square inch. Maximum strength was attained by steaming from four to eight hours, longer periods causing a decrease in strength. This result in steaming was found to occur also with brick containing 10 per cent lime hydrate and 90 per cent of sand graded from 20 mesh to dust.

The investigation is being continued, using graded sand to replace the 200-mesh sand. The factor now being studied is the effect of the size of grain of the sand upon the compressive strength, transverse strength, and absorption of brick.

4. *Investigation of Tile and Tile Walls.*

A report of the results of tests on about 200 **hollow building tile** is being prepared for publication. These tile developed strengths ranging from 4,000 to over 10,000 pounds per square inch when tested on end, and about one-half to three-fourths of these amounts when tested on edge or flat. The tests made to determine the relative degree of absorption of water showed values ranging from 6 to 11 per cent, a vitrified tile to the same scale of hardness ranging between 1 and 2 per cent. The strength of the tile was found to decrease almost directly with its degree of absorption.

The tile program also includes the **testing of walls** of widths from 3 to 6 feet; of from 6 to 8 feet, and 12 inches in thickness; and of uniform heights of 12 feet. The strength of a wall tested in this manner varies approximately from 200,000 to 600,000 pounds, depending on the thickness of the wall. About ten walls have been tested, and the work will be continued for the present year. The program is being carried out in concert with other laboratories, each laboratory endeavoring to cover the different geographical clay and manufacturing districts. (See report of A.S.T.M. Committee referred to under Information Obtainable, 3H4*e*.)

5. *Architectural Terra Cotta.*

The use of certain burned clays in the **molded or cast form,** known as **architectural terra cotta,** to distinguish it from terra cotta or hollow building-tile, is increasing very rapidly, supplanting to a certain degree cut stone and architectural metals. As a larger part of the output is placed on the exterior of buildings, where it is subjected to all the severe weather conditions of this climate, it is very essential that it must have certain weather-resisting properties. It is also in certain unforeseen cases called upon to take stresses induced by movements of parts or the whole of the structure.

Under these conditions it seemed desirable to determine the physical characteristics of terra cotta as now manufactured in order to ascertain if it is possible to improve the present method of manufacture, and also to study its use and methods of placement in structures. This investigation will begin with a study of the various clays used and will follow the material through its various stages until its final placement on the structure.

Industrial Training and Educational Research. 3H2

(*a*) An important phase in the development of the clay-working industries is the **vocational training** provided in the many pottery classes, schools of industrial arts, mechanics' institutes, and other places, some of which are maintained by states and cities and others upon substantial foundations afforded for the purpose of advancing the crafts connected with building construction and equipment.

(*b*) As mentioned under 1A1, the **colleges** and **universities** of the country are performing distinctive service in the development of materials and methods pertaining to the structural industries. Many of those listed maintain departments or branches devoted to investigation and study in **clays and clay-working.** In addition to the University of Illinois (mentioned below), others contributing to the development of the ceramic arts are: Ohio State University; Department of Ceramic Engineering, Iowa State College; Rutgers College; the New York State School of Clay-working and Ceramics at Alfred University; and the Mellon Institute of Industrial Research, University of Pittsburgh.

University of Illinois, Engineering Experiment Station. 3H2c

Director: C. R. Richards, Urbana, Ill.

Publications: (*a*) **Circulars** and (*b*) **Bulletins** on matters of general public interest and on important phases of problems affecting architects, engineers and others.

Each bulletin is subject to a free initial distribution, on the basis of existing mailing-lists. It is also placed on sale with authorized agencies, both in this country and abroad. A limited number of copies is available for free distribution upon request, after the initial distribution.

A name is placed upon the regular mailing-lists of the Station at the

request of the person, institution, or company so desiring. These lists are divided into six classes: All-Bulletin, Structural, Electrical, Fuel, Railway, and Notification. In requesting a name placed on the list, state class of bulletins desired.

Purposes: Established 1903 to carry on investigations in engineering and to study problems of importance to professional engineers and to manufacturing, railway, mining, constructional, and industrial interests of the state. In December, 1916, its new Ceramic Engineering Building was formally dedicated.

Organized Bodies. 3H3

In the field of clay-working and industries allied to it there exist the following societies and other organized bodies, many of which have committees on standardization and maintain relations with the Bureau of Standards, the American Society for Testing Materials, and other agencies toward that end.

American Ceramic Society, Inc. 3H3a

Secretary: Charles F. Binns, New York State School of Clay-Working and Ceramics, Alfred University, Alfred, N. Y.

Publications:

1. **"The Transactions"** in nineteen volumes, varying in price from $4 each, in paper, to $6.25 in cloth.
2. **List** of papers and discussions contained in "The Transactions," furnished upon request.
3. Also, **Bibliography** and **Collected Writings**, as listed under "Information Obtainable."

Purposes: Its work has been confined to discussions of the many little-understood phases of the ceramic industry and has not yet reached the stage of definite specifications. Holds an annual meeting from which the resulting contributions to the development of the whole clay-working industry, published in "The Transactions," are to be considered as of great import.

The Refractories Manufacturers' Association. 3H3b

Secretary: Frederic W. Donahoe, 316 Oliver Building, Pittsburgh.

Publications:

1. **Refractories**, a bi-monthly magazine, devoted mainly to social service work.
2. **Charts**, as listed under 3H6*d*.

Purposes: To promote a closer relation between the manufacturer, dealer, and consumer of refractories of all kinds; to improve in every way the product of its members; and to standardize, as far as possible, the various designs and shapes manufactured.

Has endowed a Fellowship in Refractories at the Mellon Institute of Industrial Research University of Pittsburgh.

National Terra Cotta Society. 3H3c

Secretary: Arthur B. Pendleton, 1 Madison Avenue, New York City.

Publications:

1. **"Architectural Terra Cotta, Standard Construction."**
2. Architectural Terra Cotta Brochure Series: **"The School," "The Theatre,"** and **"Store-Fronts."**

(1) $5 to general public; (1) and (2) free upon request, to architects and qualified inquirers. (See description of these publications, under "Practice Recommended and Standards Adopted.")

Purpose: To encourage the production of the best materials and the maintenance of high and uniform standards of work; to spread the knowledge of the many advantageous qualities of good architectural terra cotta by widely advocating its merits; to coöperate in the investigation and study of the more important technical and other problems of the industry.

The Hollow Building Tile Association. 3H3d

Secretary: E. R. Sturtevant, 111 West Washington Street, Chicago.

Purposes: To promote the use of hollow building tile, and to make for increased efficiency in the industry.

Membership is composed of seventy manufacturers throughout the country. Meetings are held annually in the interest of improved standards in building tile, their incorporation in building codes, and in the interest of modern trade development.

The American Face Brick Association. 3H3e

Secretary: R. D. T. Hollowell, Fulton Building, Pittsburgh, Pa.

Issues no publications dealing with technical subjects. Membership is composed of manufacturers and distributors of facing bricks of all kinds throughout the country.

Purpose is to promote the interests of its members, to conserve the resources and increase the efficiency of the entire face-brick industry. Holds a meeting annually, and in December, 1916, adopted two important policies in modern trade development, namely: **Uniform Cost-Finding** and the **Open Price-Plan.**

The National Brick Manufacturers' Association. 3H3f

Secretary: Theodore A. Randall, Indianapolis, Ind.

Publications: **Convention Proceedings**, other transactions, and **reports of committees** which are published in full in *The Clay Worker*, the official organ of the Association.

Purposes: An educational organization, formed to relieve the clay trade of the "rule-of-thumb" methods which formerly characterized it. Its purpose is also to promote the interests of the makers and users of clay products. Has a committee on technical investigations and holds a convention annually, at one of which, in 1893, **standards** were adopted **for the sizes of bricks.** These were reaffirmed in 1899 and still obtain. (See 3H6*f* for these sizes.)

National Building Brick Bureau, Inc. 3H3g

Secretary-Manager: Theo. A. Randall, Indianapolis, Ind.

Publications: **Pamphlets** and **reprints**, entitled "Build with Brick," and others.

Purpose is to advocate the advantages and eventual economy of brick and substantial building construction and to encourage a greater use of brick in structural work of all kinds.

National Paving Brick Manufacturers' Association. 3H3h

Secretary: Will P. Blair, Engineers Building, Cleveland, Ohio.

Publications: (1) **Dependable Highways**, monthly, $1 a year. (2) **Specifications** for **Brick Pavements** and **Roads** described under 3H6*g*.

Purposes: Dissemination among its membership of technical knowledge relating to the manufacture of their product; to bring to the attention of the public the merits of vitrified brick as a paving material; to influence to the greatest possible extent the proper construction of brick streets; furnishing faithfully information regarding brick and other materials, and comparative values as pavements.

Building Brick Association of America. 3H3j

Director and Special Agent: J. Parker B. Fiske, 40 W. 32d Street, New York City.

Publications: **Books and general literature**, as listed under Information Obtainable, 3H4*k*.

Purpose: Organized over seven years ago to provide publicity for the brick business and was supported by brick manufacturers. In a sense, this Association, which is now in the process of liquidation, laid the foundation for the American Face Brick Association, since formed, and described under 3H3*e*.

The Sewer Pipe Manufacturers' Association. 3H3k

Field Commissioner: John L. Rice, Second National Bank Building, Akron, Ohio.

Publications of interest in connection with sewer-pipe and culverts are referred to in the Structural Service Book, Vol. I, under 9B7

For description of **"Clay Products for Building Construction,"** see "Information Obtainable" in this issue. (3H4*l*)

Is composed of members engaged in the manufacture of various clay products, as will be described in Plumbing Issue.

Bricklayers', Masons', and Plasterers' International Union. 3H3l

Secretary: Wm. Dobson, University Park Building, Indianapolis, Ind.

Is one of the nineteen "affiliated Internationals" comprising the Building Trades Department of the American Federation of Labor listed in the Structural Service Book, Vol. I, and referred to under 3D2*a*, as having entered into a five year agreement with the National Association of Marble Dealers.

There is also record of:

Sand-Lime-Brick Association. 3H3m

Information Obtainable. 3H4

(*a*) The U. S. Geological Survey (2A1) has issued:

1. Many **pamphlets** and **bulletins** (2A1*d* and *g*) dealing with **clay resources** and various phases of the **clay-working industry.**
2. Chapters on **"The Clay-Working Industries"** in *"Mineral Resources of the U. S."* (2A1*c*), in which all branches are treated and complete statistics given annually.
3. The separate chapter for 1916 (2A1*d*) will shortly be available and is entitled **"Clay-Working Industries and Building Operations in the Larger Cities"**—contains many pages of valuable statistics concerning the entire building industry.

4. See particularly, *Bulletin No. 324*, 1907, 50 cents. Pp. 14–61 contain "The **Effects** of the San Francisco **Earthquake and Fire** on Various **Structures** and Structural **Materials**," Richard L. Humphrey; and pp. 62–130, "The **Effect** of the San Francisco **Earthquake on Buildings, Engineering Structures** and Structural **Materials**," J. S. Sewell.
5. See, also, **"The Fire-Resistive Properties of Various Building Materials,"** Richard L. Humphrey. Bulletin No. 370, 99 pp. 1909 30 cents.

(*b*) The U. S. Bureau of Mines (2A3), in its work on the **technology of clays**, has issued:
1. Bulletin No. 53: "Mining and Treatment of **Feldspar** and **Kaolin** in the southern Appalachian Region.
2. Bulletin No. 92: "**Feldspars** of the New England and Northern Appalachian States."
3. Technical Paper No. 99: "Probable Effect of the War in Europe on the **Ceramic Industries** of the United States."

(*c*) The Bureau of Standards has issued a number of **Technologic Papers** (1A5*b*3) regarding the drying of **clays**, testing of **clay refractories**, vitrification and dehydration of clays, viscosity of **porcelain, firebricks, sand-lime-brick**, etc., all of which are listed in "*Publications of the Bureau of Standards*." For current investigations by the Bureau, see extracts from *Report* under 3H1*c*.

(*d*) In the "*Annual Report*" of the Chief of Ordnance, Watertown Arsenal (1A3*b*) will often be found results of **tests on clay products.**

(*e*) See "*Proceedings*" of the American Society for Testing Materials (1A5*c*1), as follows:
1. Vols. XIII, XIV, and XV, Part I, for **"Report** of Committee C–3 on **Standard Specifications for Brick; I, Building Brick; II, Paving Brick"**; containing results of tests and other data and suggestions concerning building brick. (See, also, Standards Adopted, 3H6*b*4.)
2. Vol. XVII, Part II, for "Suggested Improvements in the Manufacture of **Silica Brick**," C. E. Nesbitt and M. L. Bell.
3. Vol. XVII, Part I, Report of Committee C–10 on **Hollow Building Tile.** This, the first report of that Committee, is accompanied by a statement of organization, scope of work, and progress. Four subcommittees exist on **Strength and Foad Tests**, on **Fire Tests**, on **Absorption and Frost Resistance**, and on **Insulation and Acoustics.** A list is given of twelve laboratories which are conducting coöperative tests (including the Bureau of Standards as mentioned under 3H1*c*4). Twenty-five pages are given over to tables of results of tests already made on compression, absorption, and in walls.

(*f*) The American Ceramic Society, Inc. (3H3*a*), has published:
1. **"A Bibliography of Clays and the Ceramic Arts,"** Dr. John C. Branner, 1906. Contains 6,027 titles of works on ceramic subjects. Cloth, $2.
2. The collected writings of Dr. Herman August Seger, Vol. I, 552 pp., cloth, $7.50, contains:
   (*a*) **Treatises** of a general scientific nature.
   (*b*) **Essays** relating to **brick and terra cotta, earthenware,** and **stoneware** and **refractory wares.**
3. Vol. II, 605 pp., cloth $7.50, contains:
   (*a*) Essays on **whiteware** and **porcelain.**
   (*b*) Travels, letters and polemics.
   (*c*) Uncompleted works and extracts from the archives of the **Royal Porcelain Factory.**

To secure **"List** of papers and discussions" see 3H3*a*2.

(*g*) The University of Illinois Engineering Experiment Station (3H2*c*) issues, among others, *Bulletins* as follow:
No. 27: **"Tests of Brick Columns and Terra Cotta Block Columns,"** A. N. Talbot and D. A. Abrams. 1909. 45 cents.
No. 36: "The Thermal **Conductivity of Fire-Clay** at High Temperatures," J. K. Clement and W. L. Egy. 1909. 20 cents.
No. 44: **"An Investigation of Built-up Columns under Load,"** A. N. Talbot and H. F. Moore. 1911. 35 cents.

(*h*) The Minnesota State Art Commission held a competition for a **brick or tile house** to cost $2500. Illustrations of the drawings submitted appeared in the *Minnesotan*, and a folio containing the drawings of eighteen of these houses, each accompanied by a complete "bill of goods," may be had for $2 from the Minnesota State Art Commission, Minneapolis.

(*j*) *Journal of the Society of Constructors of Federal Buildings* (1A2*d*1).
1. **"The Manufacture of Vitrified Brick,"** C. B. Sullivan. November, 1914.
2. **"Rough-Texture Brick:** A Query," J. A. Sutherland. May, 1916.
3. **"Architectural Terra Cotta,"** Thos. F. Armstrong. March, 1916.

(*k*) The Building Brick Association of America (3H3*j*) held a series of competitions through the medium of the *Brickbuilder*, and over one thousand plans were secured for **brick houses.** These were divided into groups and published in three books, entitled:
1. **One Hundred Bungalows.** 50 cents.
2. **A House of Brick of Moderate Cost.** 50 cents.
3. **A House of Brick for $10,000.** 25 cents.

General literature was also published as follows:
4. **The Beauty of a Brick House.** 5 cents.
5. **The Maintenance of a Brick House.** 5 cents.
6. **The Brick House Safe from Fire.** 5 cents.
7. **Brick or Frame: Which?** 5 cents.
8. **A Revolution in Building Materials.** 5 cents.
9. **The Cost of a House**—a Comparison between Brick, Wood, Cement and Hollow Block Construction, J. Parker B. Fiske. 10 cents.

(*l*) In the Sewer Pipe Manufacturers' Association (3H3*k*) 32-page booklet, "*Clay Products for Building Construction*" are descriptions and illustrations of **vitrified clay wall-copings, fire-clay flue-linings,** and **chimney-tops.**
It also contains building-code suggestions and diagrams from publications of the National Board of Fire Underwriters on the **construction of chimneys and flues**; also a chimney and flue **ordinance** suggested by the National Fire Protection Association.

(*m*) See *Quarterly* of the National Fire Protection Association for:
1. **"Hollow Tile Construction,"** Vol. VII, No. 1.
2. **"Terra Cotta or Tile Blocks,"** Vol. IV, No. 4.
3. **"Hollow Tile** as a Factor in Fire-Prevention," Vol. II, No. 2.
4. For literature of further interest and value on all subjects treated under this head, see *Index* to publications of the N.F.P.A., and see, also, "Practice Recommended and Standards Adopted" (3H6) for appropriate publications of the N.F.P.A. and of the National Board of Fire Underwriters.

(*n*) "The Development of the **Ceramic Industries** in the U. S.," a "communication" by A. V. Bleininger, presented before the Franklin Institute, Philadelphia, Nov. 2, 1916; also, **"Some Industrial Problems in Silicate Technology,"** delivered before the Franklin Institute on Dec. 14, 1917.

(*o*) See various issues of *The Clay Worker* for papers and reports mentioned under The National Brick Manufacturers' Association and for other articles of interest.

(*p*) Read **"Standardizing Face Brick,"** F. W. Donahoe, *Brick and Clay Record*, Oct. 3, 1916.

(*q*) "Some Attractive **Homes** Built **of Tile and Stucco,"** E. C. Bartholomew, in *Architecture*, November, 1917. 4 pp.; illus.

(*r*) "The Artistic Expansion of **Architectural Clay Products**—its Dependence on the Architect for Direction in Style and Treatment," Leon V. Solon, in *The Architectural Forum*, September, 1917. 4 pp.

(*s*) "The Relation of the Potter to the Architect," Leon V. Solon, R.B.A., in *Architecture*, August, 1913. 5 pp.; with elevations and sketches showing the application of **"ornamental tile."**

(*t*) "Notes on the Compressive Resistance of **Fire-Stone, Brick Piers,** Hydraulic Cements, **Mortars** and Concretes," Gen. Q. O. Gilmore.

(*u*) "Building-Stones and **Clays, Their Origin, Character and Examination,"** E. C. Eckel.

(*v*) **"Practical Brick and Tile Book,"** Dobson-Hammond.

(*w*) **"Clays, Their Occurrence, Properties and Uses,"** H. Ries.

(*x*) **"Brick Houses and How to Build Them,"** Radford.

(*y*) **"Brickwork and Masonry,"** Mitchell.

(*z*) **"Bricks and Tiles,"** Dobson.

Pocket-Books, Handbooks, and Other References. 3H5

In addition to the foregoing see, among others, the following publications for sections containing specific information on these subjects.

(*a*) *Kidder's Pocket-Book*, 1916:
1. **Data on Bricks and Brickwork**, pp. 1454–1462.
2. **Terra Cotta, Hollow Tile, and Brick** (see Index to Kidder's).

(*b*) *Fire Prevention and Fire Protection*, J. K. Freitag, 1912, contains a chapter on "Wall Construction," which treats of **ornamental terra cotta**, with many **construction details** and notes, and of **structural terra-cotta** walls and **brickwork**; also chapters containing descriptions and illustrations of **hollow-tile floors, girder and beam protections**, combination hollow-tile and concrete floors, and other forms of burnt-clay construction.
Fireproofing of Steel Buildings by the same author (1909) contains descriptions and diagrams of a similar nature.

(*c*) **The Civil Engineer's Pocket-Book**, J. C. Trautwine.

(*d*) *Building Construction and Superintendence*, F. E. Kidder. Part I, "Masons' Work."
1. **Bricks and Brickwork**, Chapter VII.
2. **Architectural Terra Cotta**, Thomas Nolan. Chapter VIII.
3. **Form of Specifications** (for all parts of a building) Including **Architectural Terra Cotta and Brickwork**, Chapter XIII.

(*e*) *The Building Estimator's Reference Book*, Frank R. Walker. Sections on **Terra Cotta, Hollow Tile and Brickwork.**

(*f*) *Building Trades Handbook*, International Correspondence Schools.
1. **Brick Masonry.**
2. **Chimneys and Fireplaces.**
3. **Hollow-Tile Construction.**

(*g*) *Handbook for Architects and Builders*, Illinois Society of Architects, Vol. XX, 1917. **Bricks and brickwork; also details of iron anchors, hangers, straps, clips, etc., used in setting architectural terra cotta.**

(*h*) **American Civil Engineers' Pocket-Book**, M. Merriman. 1916.

(*j*) **Mechanical Engineers' Pocket-Book**, William Kent. 1916.

(*k*) **Mechanical Engineers' Handbook**, Lionel S. Marks. 1916.

(*l*) **Crosby-Fiske Handbook of Fire Protection**, E. U. Crosby and H. A. Fiske. 1914.

(*m*) See *Index* to **Lefax Data Sheets**, (1) Civil, (2) Mechanical.

(*n*) **Handbook of Cost Data for Contractors and Engineers**, H. P. Gillette.

(*o*) **The Building Foreman's Pocket-Book and Ready Reference**, H. G. Richey. 1118 pp.; illus.

(*p*) **A Handbook for Superintendents of Construction, Architects, Builders and Building Inspectors**, H. G. Richey.

(*q*) **Details of Building Construction**, Radford.

(*r*) See **Clayworkers' Handbook**, Searles.

(*s*) For **"Brick and Terra Cotta Work During the Middle Ages and the Renaissance in Italy,"** see book with that title by Henry Strack, translated by Leigh Hunt, 1916, containing original sketches and drawings.

(*t*) Also, *Beitrage zur Kenntniss der Backstein—Architectur Italiens*, by L. Runge, architect, 1853, containing 24 line plates, showing **brick, terra-cotta, and faience work.**

(*u*) As of **further interest**, see some of the publications listed under "Estimating Conditions, Quantities and Cost Data," (1D); also the sections in the *Structural Service Book, Vol. I*, on Reports on Buildings under Fire (3E1), Vertical Structural Features (4C), Horizontal and Sloping Features (4D), Chimneys, Flues, and Fireplaces (10H).

(*v*) *Catalogue, Architectural Exhibition*, 1913, St. Louis Architectural Club, contains an excellent **treatise on brickwork**, detailed and illustrated, with an introduction by Wm. B. Ittner.

(*w*) **The Brick Church and Parish House**, published 1915 by Hydraulic Press-Brick Co., contains "Notes on Church Architecture in America" and plates and illustrations of the "*Brickbuilder's* Competition."

For illustrations and other data on **Face Bricks**, see Industrial Section, p. xxi, Hydraulic Press-Brick Co.

(*x*) See, also, *Atlantic Terra Cotta*, printed monthly for architects, and distributed by the Company with that name.

(*y*) *For some references to sand-lime-brick*, see:

1. U. S. Geological Survey Publications: "*Mineral Resources of the U. S.*, Part II," chapter on **"Sand-Lime-Brick"** (2A1*c*); and same Chapter issued as a separate publication.
2. Bureau of Standards *Technologic Paper No.* 85: **"Manufacture and Properties of Sand-Lime-Brick,"** Warren E. Emley, March 22, 1917.

Practice Recommended and Standards Adopted. 3H6

(*a*) Department of the Navy, U. S. A. issues:

1. **"Brick and Cement, Fire,"** *Specification*, 50B6, May 1, 1916.
2. **"Bricks and Cements, Converter and Open Hearth,"** *Specification*, 50B5, May 1, 1916.

(*b*) American Society for Testing Materials (1A5*c*) publishes:

1. **Tentative Tests for Refractory Materials under Load at High Temperatures** (Serial Designation C 16–17 T).
2. **Tentative Tests for Slagging Action of Refractory Materials** (Serial Designation C 17–17 T).
3. **Tentative Methods for Ultimate Chemical Analysis of Refractory Materials** (Serial Designation C 18–17 T).
4. **Standard Specifications for Paving Brick** (Serial Designation C 7–15).

(*c*) National Fire Protection Association:

(See "List of Publications Available" on pp. 43, 44 of the *Structural Service Book*, Vol. I.)

1. **"Chimneys, Flues and Fireplaces,** To Provide for the Safe Construction of."
2. *Field Practice:* Chapter II, **"Furnace Stacks, Chimneys and Flues"**; Chapter VII, **"Chimneys and Flues, Their Common Dangers,** Means of Safe Construction, Repairing and Maintenance."
3. **"Chimneys, Flues and Fireplaces."**
4. **"Specifications for Construction of a Standard Building"** and specifications for construction of **Office Buildings** and other types for which see reports of the Committee on Fire-resistive Construction.

(*d*) National Board of Fire Underwriters:

(See "List of Publications Available" on pp. 44, 45 of the *Structural Service Book*, Vol. I.

1. **"A Recommended Building Code"** 1915: Part VI, "Walls," pp. 34–50.
2. **"Dwelling Houses." A Code of Suggestions for the Construction and Fire-Protection of,** Part III, "Walls," pp. 21–31.
3. **A Suggested Building Ordinance** for Small Towns and Villages, provides for the construction and equipment of ordinary non-fireproof buildings.
4. **A Code of Abbreviated Ordinances** for Small Municipalities.

(*e*) The Refractories Manufacturers' Associations (3H3*b*) has committees to work with the American Society for Testing Materials, with the Refractories Committee of the American Gas Institute, and on **Standardization of Fire Clay**, on **Silica**, and on **Government Adoption of Standards.**

It has adopted the following five standards, which have been issued as the beginning of a series of *Charts* (of Institute standard size) entitled:

1. **Standard 9-inch and 9-inch Series Brick Shapes** adopted July 29, 1913.
2. Some of the Representative **"Class B—Special Shapes"** adopted December 8, 1914.
3. **Standard 9-inch and 9-inch Series Silica Brick Shapes** adopted July 11, 1916.
4. **Standard Class "B" Silica Brick Shapes** adopted January 9, 1917.
5. Tables showing number of **brick required to turn various circles**, the brick being of standards adopted by The Refractories Manufacturers' Association.

(*f*) The National Terra Cotta Society (3H3*c*) has issued an *Architectural Terra Cotta Brochure Series:*

1. Vol. I. **"The School."** Illustrated by photographs of many modern school buildings, erected entirely or in part of terra cotta.
2. Vol. II. **"The Theatre."** Illustrated by many photographs of terra-cotta theatre buildings.
3. **"Store-fronts in Terra Cotta."** Illustrating and describing the appropriate use of architectural terra cotta for the small store-front.
4. **"Architectural Terra Cotta, Standard Construction."** July, 1914. A book of construction drawings (70 plates) showing the most approved form of terra-cotta construction for cornices, friezes, balustrades, etc., with anchorage irons and detailed notes, complete.

(*g*) National Brick Manufacturers' Association (3H3*f*).

1. *Standard sizes for bricks:*

The following are the sizes officially adopted as Standard: **Common brick**, 8¼ x 4 x 2¼ inches; **paving brick**, 8½ x 4 x 2½ inches; **pressed brick**, 8⅝ x 4 x 2⅝ inches; **Roman brick**, 12 x 4 x 1½ inches; **Norman brick**, 12 x 4 x 2⅝ inches.

It is to be noted that, due to the different kinds of clay used and varying degrees of heat by reason of location of bricks in the kiln, these sizes will naturally vary slightly, though presumably not enough to affect any layout which allows for ample jointing.

(*h*) The National Paving Brick Manufacturers' Association (3H3*h*):

1. *Specifications* for the Construction of **Vitrified Brick** Street **Pavements** and Country **Roads** (furnished upon request), containing:

(*a*) Green Concrete Foundation; (*b*) Sand-Cement Superfoundation; (*c*) Sand-Cushion Type.

(*j*) National Fire Proofing Co.:

For suggested **details** of wall construction with **hollow-tile building blocks** and for *"Manufacturers' Standard Specifications"* prepared by that Company in collaboration with the editor of the Structural Service Department while acting as Consulting Architect to Sweets Catalogue Service, see pp. 304, 305, "Sweets Architectural Catalogue, 1916."

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